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NOTES ON PELICAN ISLAND.

BY GEO. NELSON.

Plates IV–VII.

FOR a great many years the Brown Pelicans (*Pelecanus occidentalis*) of the east coast of Florida have occupied as a breeding site, a small island in the Indian River near the town of Sebastian. This island, popularly known as Pelican Island, is not over three acres in area, and only at the sandy ridge at the eastern end is it but little over two feet above the normal water level. Many years ago it was well covered with mangrove trees, in which the birds nested, but now only a few bleached stumps remain. Formerly the nesting season started early in the winter, and was terminated by the following summer, but in recent years, each successive season began a little earlier, and continued somewhat later than the previous one until the years 1908 to 1910 when the island was occupied as a breeding site for twenty-four consecutive months. During the last week in October, 1908, the birds arrived at the island, and the general body of them started building at once. Additional though smaller colonies were continuously arriving until the summer of 1909, and some of the young of these later colonies were still too young to leave when the main body of old birds arrived in October for the new nesting season. The 1909 season continued in much the same manner as the previous one until the third week in October, 1910, when Florida was visited

by a violent hurricane; the river rose and completely submerged the island, driving the young to the more elevated islands near by. The reason for this high water may be attributed to the shape and character of the Indian River. For many miles north of Pelican Island the Indian River is a mile or more in width, while a few miles south the width is but a few hundred yards. When the wind is strong from the north for a continued period the water is blown down the shallow river, and, as so great a body of water cannot pass though the "narrows" quickly enough, the river rises for miles above. For more than three weeks after this hurricane Pelican Island was flooded, and it was during this period that the Pelicans arrived for a new nesting season. Their old home having disappeared, they finally began building on one of the larger islands situated about 400 yards southeast of the old island, while about a dozen nests were built on two small islets near by. They were evidently very well satisfied with their new sites, for, although the lowering water soon restored their former island to its normal size, not a single nest was built on it during the entire season.

The new island is peculiarly adapted to the welfare of the Pelicans. It is much larger than the old island, having an area of fully twenty acres, about one half of which is densely wooded with large black mangroves. There are a few small patches of red mangroves near the water. The wooded section is mainly located on the northern and western parts, thereby forming very effectual protection to the majority of birds from the cold "northers." The shape of the island can, with a little imagination, be likened to a pelican at rest, with its head lowered to its shoulders.

Although Brown Pelicans originally preferred arboreal nesting sites, and conditions on the new island seemed favorable for such sites, less than one sixth of the five thousand nests were placed in the trees. This small percentage of tree nests leads us to infer that ground sites are now preferable to arboreal ones. It is so many years since the majority of the birds could have nested in trees, that there can be very few of the present generation that have nested, or were raised in trees; and it is quite probable that those who did so the past season had some previous experience.

On the new island I had many opportunities to contrast the advantages of the terrestrial with the disadvantages of the arboreal nesting sites.

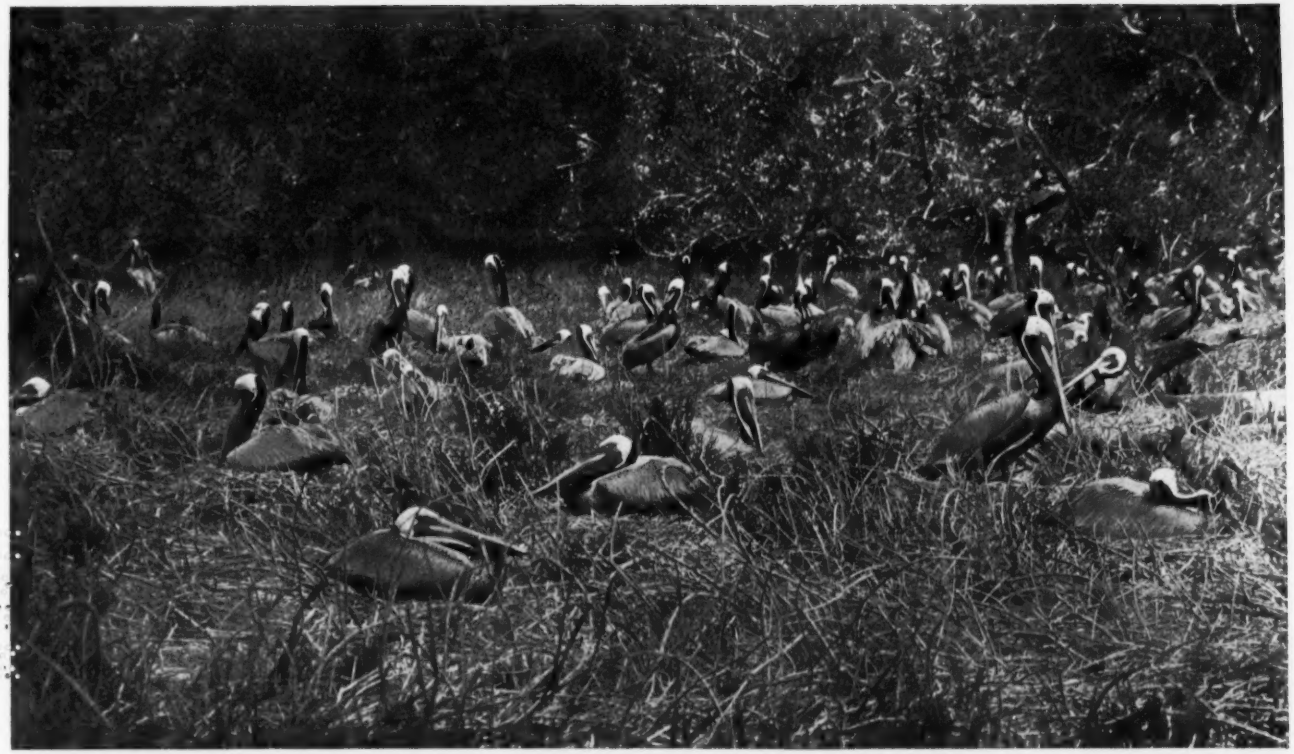
In the arboreal nest, the young pelicans, as soon as they are able to walk with any degree of security, begin to crawl out on the branches, and in many cases are unable to return to the nest to be fed. When the parent birds return to feed their young they land at the nest and pause awhile, then, if their offspring are unable to return, the old birds finally answer their pleadings by flying out and feeding them, but not without considerable difficulty. The outer branches of the mangroves, being very slender and weak, form very insecure perches for such heavy and clumsy birds, and every feeding operation in such places becomes a ludicrous balancing act. The semi-crazed actions of the young pelicans after being fed are undoubtedly the cause of considerable mortality among the young in the taller trees. During these spells they are in great danger of falling to the ground, or they remain in awkward positions among the lower branches. The greatest number of dead young I saw on the island were hanging in these positions, or were on the ground beneath the trees. The cold periods which are becoming more numerous and severe in this section of Florida would be the cause of some mortality among the half grown young, perched on the branches in exposed positions. The ground nesting birds experience none of these difficulties. Here the parent birds can make an easy and graceful landing at any time, and feed their young with greater facility. The young can wander about, thereby getting strength and exercise not possible with tree-nesting birds. No mishap can here befall them while "performing" before and after being fed. They can move to protected places during cold windy weather. The percentage of dead young in the ground nesting localities was not nearly so large as it was among the tree nesters.

The river is very shallow near the new island, and a comfortable landing can be made only on the eastern point. It is on this eastern point where the warden usually lands visitors. Over three hundred persons were landed here during the past season. The birds in the vicinity of this point have been so accustomed to seeing people, that they will allow of very close approach. That all of the birds are not as easily approached as those of the eastern end, became very evident when, on one occasion, the warden and I, wishing to explore the densely wooded interior of the island,

landed on the northwestern end. None of the young here that were able to fly would allow of close approach but would usually disgorge three or four fish and thus lightened take to flight. At times we could hear the spattering noise of falling fish before we got to the trees the birds were leaving. All the fish examined proved to be Menhaden (*Brevoortia tyrannus*) about eight inches in length. There is a large treeless space of perhaps two acres, in the centre of the island, so thickly overgrown with "sea parsley" (*Sesuvium*) that it was with some difficulty we made our way over it. Overhead the birds were flying with great speed in large circles. This is the alarm flight of the Pelicans, and can be seen for more than a mile. It is one of the warden's most reliable signs that the pelicans have unwelcome visitors. There were isolated nests in some of the trees in the interior, most of them unoccupied.

During this trip we flushed a Clapper Rail, a Yellow-crowned Night Heron, and a Yellow-throat (*Geothlypis*). These, with a pair of Great Blue Herons, the Pelicans, and the ever present Buzzards were the only birds we saw in the interior. Almost daily, during March, from fifty to two hundred Florida Cormorants were seen around the island, also large numbers of Lesser Scaup Ducks, a few Little Blue and Louisiana Herons, Fish Hawks and Kingfishers. Should the Pelicans continue in the future to breed on this island, some of the Herons, Egrets and White Ibises will probably colonize with them, as they did many years ago, when there were trees on the old island.

To the nature photographer Pelican Island is peculiarly interesting, for almost any day during the first five months of the year, one can find all possible stages of Pelican life, from nest building to the full grown young bird. The use of a "blind," or place of concealment is neither necessary nor advisable on Pelican Island. In erecting a blind, one of course has to flush the sitting birds, which leave with a great rush, and in many cases, eggs and small young are thrown out of their nests. Then, if the sun is shining, its burning rays would shortly bring about fatal results, as the naked young are naturally seldom wholly exposed to the sun for only a very brief period. I had no trouble in walking very slowly, though with many pauses, to within twenty feet of a colony of birds with newly hatched young. Here I slowly set up



NEW PELICAN ISLAND, FLORIDA, 1911.

SHORE SCENE ON NEW PELICAN ISLAND.

PELICAN YAWNING.

STRETCHING THE POUCH

CEREMONY OF NEST-RELIEF.

my camera on a tripod, and by using long-focus lenses, obtained large images of them while they were stretching, sleeping, yawning, and even feeding the small naked young. Photographs of the feeding of the larger young can very easily be obtained by waiting near some of them until the parents arrive. While there is almost always a feeding scene in sight, there are three periods during the day when they are very numerous; in the morning from 7 to 8, and again from 11 to noon, and from 4 to 5 P. M. It is during the 11 A. M. period that the largest number are fed. The island at this time is fairly alive with feeding scenes, the noise of the squawking young being almost deafening.

The 1911 breeding activities were abruptly terminated about the fifteenth of June, by a new and unexpected enemy. Millions of mosquitoes descended upon the birds and so persistently tormented them, that about six hundred nests containing small young were abandoned, and these young, of course, soon perished. This mosquito event may furnish a reason why the Pelicans have become, in the past, so attached to the old island. It being the outermost, and the only barren and exposed one in the vicinity, it consequently receives the full force of every breeze, and must be much less frequented by mosquitoes and other pests than the other islands. Although the season of 1910–1911 came to a close much earlier than that of many previous years, it was one of the most prolific seasons as to the number of young raised to maturity in the history of the colony; the increase being estimated at about six thousand.

Barring a repetition of the conditions which confronted the birds upon their arrival last season, it may be reasonable to suppose that they will return to the old island, but, as there are now too many Pelicans to nest there comfortably, it is very probable that both islands will be abundantly populated. Should this be the case we can be assured of even a more marked increase in the number of Brown Pelicans of the east coast of Florida than that which made the season of 1910–1911 so noteworthy.

THE EXPRESSIONS OF EMOTION IN THE PIGEONS. II. THE MOURNING DOVE (*ZENAIDURA MACROURA* LINN.).

BY WALLACE CRAIG.

INTRODUCTION.

THE chief purpose in writing this paper on the Mourning Dove at the present time, is to furnish a basis of comparison for the article which is to follow, on the Passenger Pigeon. For if that remarkable species is extinct, the strange facts regarding its voice and manners ought to be most carefully recorded. The voice and manners of even our most abundant and most familiar birds have been so inadequately studied that we have scarcely a tithe of the complete biography of any one of them; and so the writer feels that the following account of the expressions of emotion in the Mourning Dove is worth while for its own sake. Yet the chief interest in this paper at the present time will come from the light which it helps to throw upon the Passenger Pigeon.

A much more detailed study for comparison is to be found in the first paper of this series [1] on the Blond Ring-Dove, or "Collared Turtle Dove," the species commonly kept in cages; and a still further study in a paper entitled 'The Voices of Pigeons regarded as a means of Social Control' (1908, Craig). The work reported in those papers and in the present two, was done under the guidance of Professor C. O. Whitman, of the University of Chicago, to whom I shall often have occasion to refer as the chief authority on the habits and general biology of the Columbæ. My studies were made in Professor Whitman's large collection of living pigeons, and with his constant direction and advice. I take this opportunity of expressing once more my gratitude to Professor Whitman for his personal interest, his guidance and his counsel, and for the rare privilege of studying in his aviary, stocked with a splendid collection of pigeons from all parts of the world.[2]

[1] The Expressions of Emotion in Pigeons. I. By Wallace Craig. Journ. Comp. Neurol. and Psychol., Vol. XIX, 1909, pp. 29–80, with 1 plate.

[2] Since these lines were first written, news of the sudden death of Professor Whitman has brought grief to those who knew him personally, and sorrow to all biologists.

A complete account of the expressions of emotion in any bird must contain both a descriptive and a narrative presentation. The present paper accordingly will be divided into two parts, the first descriptive and the second narrative, thus: A. The Forms of Expression; B. The Life-History of Expression.

A. THE FORMS OF EXPRESSION.

General Bearing. The general bearing of a bird, even when it is standing still or slowly walking, may be as specific as its song or its call-note. This is particularly true of the Passenger Pigeon, as we shall show in the next article in some detail, one of these details being the specific way in which the Passenger Pigeon nods its head. Many pigeons nod their heads in a manner characteristic of the species; some species are characterized by the fact that they do not nod at all. The Mourning Dove nods in a way which is similar to that of several of the smaller species: its nod consists of, first, a quick throw of the head obliquely back and up; secondly, as the head comes down again, the tail goes up, up to a very considerable height; lastly, the tail sinks slowly to its normal level and remains so until the next nod. We shall see that the Passenger Pigeon nods in a very different style.

When the Mourning Dove is flying, as is well known, the swish of its wings through the air has a clear, loud, musical tone. So far as I know, this whistling of the wings, unlike the nod just described, is not at all under the control of the bird and is not expressive of any psychic state.

Enmity. I have not had opportunity to observe Mourning Doves fighting. It may be presumed that their fighting is like that of the majority of pigeons. Hence, I shall postpone the discussion of enmity until we take up the Passenger Pigeon, and shall then give a careful account of it.

Fear (Defensive). The expression of fear that is seen in all brooding birds, and also in all young fledglings — the erected feathers, glaring eye, snapping bill, and low hiss — is exhibited by the Mourning Dove with the usual intensity. The details are so familiar to bird-lovers that a description of them in this article is unnecessary.

Alarm (or Fleeing Fear). The expression of fear treated in the preceding paragraph is that of a bird which, for one reason or another, must stay in its place and meet the danger: A bird when fleeing from danger exhibits a very different expression which it is best to distinguish with the separate name, alarm. The expression of alarm, indeed, is quite the opposite of the expression of defensive fear: for in defense the bird makes itself appear as large and terrible as possible; but in alarm it appresses all the feathers, and, stretching out the neck to get a good view of distant danger, appears extremely slender, inoffensive and inconspicuous.

This expression of alarm is found in all pigeons, and in most if not all is accompanied by an *alarm-note.* The alarm cry of the Mourning Dove, like that of the Blond Ring-Dove, is a single, short, emphatic ejaculation, which at once communicates the alarm to all birds within hearing. Another sound which is well understood as an alarm signal is the noisy fluttering of a frightened bird: let one faint-hearted bird beat against the bars of his cage, the noise of his fluttering will spread terror throughout the aviary.

The Kah. The Blond Ring-Dove, as all fanciers of this cage bird know, not only coos but utters vociferously on a great variety of occasions a cry sounding like *kah kah kah kah kah.* This utterance is common to a great many species of pigeons, though in most species it is a single note instead of a repetitional cry. In the Mourning Dove, however, this utterance is greatly reduced; all its variations and applications have disappeared save one, which is the *copulation-note.* The copulation-note is given by both male and female, immediately after coition; in the Mourning Dove it is a faint growling note, repeated two to four times, with rests between. So far as I have seen, the Mourning Doves, throughout the utterance of these sounds, keep the bill wide open; but I know of no other species of pigeons which utters any sound with the bill wide open.

The Charge. The Mourning Dove shares with many other pigeons, including the Blond Ring-Dove, a habit of charging upon other individuals with the head held horizontally forward, the tail pointed horizontally back, and the whole body raised till on the tips of the toes. (Expressions in Pigeons, I, plate, fig. 2). In charging, the bird often gives a great leap, or even a series of

leaps, whereas on all other occasions he walks, advancing one foot at a time. The attitude of the charge has become very definite, conventionalized, as it were; perhaps originally the attitude was simply a result of its being the easiest way to cleave the air at full speed, but now it has become a form, a ceremony, and we see the dove assume this position and stalk about slowly, though with scarcely suppressed energy, whenever his aggressiveness is aroused and he is thinking about charging somebody. The Ring Dove, as he charges, utters a loud *kah*, but the Mourning Dove charges silently.

The Coo. (*a*) *The Perch-Coo*, or *Song.* The cooing of the Mourning Dove is of two distinct types, which may be called respectively the perch-coo, or song proper, and the nest-calling coo, or nest-call; the song being sung usually from a perch, whereas the other coo is given typically in the nest or in a place where the birds are making overtures toward nest building. These two types of coo are distinguishable in nearly every species of pigeon; indeed, many species have three or more different coos, but the Mourning Dove has only these two. The song of the Mourning Dove serves functions which, in the Ring-Dove, are divided between the perch-coo and the bowing-coo.

The perch-coo of this species is the well known strain the plaintive sound of which has given to the bird the name of "Mourning" Dove. This strain impresses one as most beautifully melodious, not only when contrasted with bird songs of a far inferior order, but even in the pigeonry where the Zenaidura competes with the gentle cooers of the whole world. Some pigeons have more elaborate songs, but for romantic sweetness there is no pigeon song I ever heard which can approach that of our Mourning Dove. It consists of a series of three (sometimes four) notes on one pitch, preceded by an introductory note which begins below the sustained pitch, glides up above it, and then down to it, thus (No. 1):

The last note in this score is usually omitted. The mere notation can convey no adequate idea of the exquisite plaintiveness of the

strain as rendered by the bird. This song is always given singly, never in a series of repetitions, differing in this respect from the songs of the Ring-Doves and many other species.

When delivering his song, the Mourning Dove does not perform any dance or gesture, as some birds do. He invariably stands still when cooing; even when he coos in the midst of pursuing the female he stops in the chase, stands immovable until the coo is completed, and then runs on. His attitude is, to be sure, very definite, the neck somewhat arched and the whole body rigid; but the impression it gives one is, not that the bird is striking an attitude, but that he is simply holding every muscle tense in the effort of a difficult performance.

The female also utters the perch-coo, though less often than the male, and in a thin, weak voice and staccato tones, which, as compared with the male's song, form so ludicrous a caricature that on first hearing it I burst out laughing. A human burlesquer could not make a more clever travesty. The female's song seems abortive in another way also, in that it is very variable. Four variations of it are represented in the following notations (Nos. 2–5).

First note hoarse, chest-tone.
Second and third notes clear head-tones.

The Coo. (*b*) *The Nest-Call.* The male Mourning Dove, not content with one exquisite lay, sounds also a nest-call which is very different in expression and in its way as perfect as the song. This call is much shorter than the song, and much fainter, so that the field observer may fail ever to hear it. Its typical form is of three notes, a low, a high, and a low, thus somewhat resembling

the first bar of the song, but differing in that the three notes do not glide into one another, there being a clear break from each note to the next. The reader will see that this description would fit the Swiss yodel, and in fact the call of the Mourning Dove is in many instances a perfect yodel. However, in some cases the three notes are not thus distinct, two of them or even all three being slurred together. The following musical scores represent the gradations of such slurring, progressively from No. 6 to No. 9. (For No. 6 see p. 402.)

These samples show that the nest-call of the male is much more variable than his song.

The nest-call is given, as said before, usually in the nest, or in some spot which is likely to be chosen as a nesting site. This is true not only of the Mourning Dove but of pigeons in general; and though the sound differs greatly from species to species, the nest-calling attitude is much the same in all, the male sitting with his body tilted forward, tail pointing up at a high angle, the head so low that bill and crop may rest on the floor, or if the bird be in the nest, the head is down in the hollow. Both the voice and the attitude of the male serve to attract the female, for in all pigeons the nest-call is accompanied by a gentle flipping of the wings, ogling eyes, and a seductive turning of the head. In addition to these general columbine gestures, Zenaidura has a special bit of display of his own, for during the first note of the nest-call he spreads his tail just enough to show conspicuously the white marks on the outer feathers; soon as this first note is past, the tail closes and the white marks disappear, to flash out again only with the next repetition of the nest-call, before which there is always a considerable interval.

The nest-call of the female I have not often heard, and I am unable to say how far it differs from that of the male.

B. THE EXPRESSIONAL LIFE-HISTORY.

The preceding pages on the forms of expression have given but little information as to the uses of expression, for these uses can be understood only in connection with the life-history of the species. The life-history can be given here merely in outline; further details can be found in the numerous biographies of the Mourning Dove, in the paper on 'The Voices of Pigeons regarded as a Means of Social Control' (Craig, 1908), and also in the paper on the Blond Ring-Dove (Expressions in Pigeons. I), for the life-histories of the Ring-Dove and Mourning Dove are fundamentally alike.

First, a few remarks on the *development of the young.* The young Mourning Dove even in his squeaking is far more musical than other pigeons; for the begging note of most young pigeons is burred and querulous, but the cry of the young Mourning Dove is a musical sibilant, sliding up the scale, and easily imitated by whistling *ssssst.* Gates, in his very interesting paper (1909, p. 11), shows that the young acquires the adult song in a gradual and progressive manner. Nevertheless, the song is not acquired by imitation (Craig, 1908, pp. 89–91); pigeons seem totally devoid of that power of mimicking or mocking which is so wide-spread among the Oscines.

The *breeding habits* of the Mourning Dove as they appear to the ordinary field observer have been described so many times that a repetition of field observations is here unnecessary; I shall treat preferably those details of behavior which can be better observed in the aviary than in the field. As a basis of the narrative I shall tell the story of a pair of captive birds kept in my room, under constant observation, in the summer of 1902.

A pair of Mourning Doves from Professor Whitman's aviary were brought to my room in the month of June. Whether they had reared a brood earlier in the year, I do not know; but in any case the removal to strange quarters naturally interfered with the continuity of their family life, and it was many days before they became amorous again. The male was a little wild, and cooed but seldom. The female was more tame and contented, and it was she who at length caused the bursting forth of the passion that was but smoldering in both their breasts. For on July 2, at 11:17

A. M., she cooed. The song of the female, you remember, is not heard very often, and the effect of this coo upon the male was electrical: he rose majestically to his feet and strutted on tip-toe around the female; then he cooed once, and charged upon her; he chased her all about the cage, stopping three or four times to coo. This charging and driving the female is a regular part of the courting performance. Courtship, having thus recommenced, proceeded daily with singing and charging and some show of anger, for there were Ring-Doves in an adjoining cage which aroused the jealousy of the male.

The nest-call was not heard until July 12. On hearing it, I put in one corner of the cage an artificial nest made of straws in a cigar box. The male dove, however, tried different corners of the cage again and again and again before he finally settled upon the nesting place. Each time that he went to a new corner of the cage he put his head down to see if he could comfortably nest-call there: if he succeeded in getting comfortably into the nest-calling attitude, then he proceeded to nest-call until the female came to him. In one case he called thus for four or five minutes, repeating his refrain forty-five times; then at last the female was aroused and ran excitedly to him. Each time the female thus came to the male in his chosen corner, they both huddled close in that corner caressing one another ecstatically for many minutes together, the male continuing, though at longer intervals, to repeat the nest-call. By this performance, the pair come to an agreement upon a nesting-site, fix the location of it in their memories, and in a true sense consecrate that spot as their home, their temple.

After the nest site, by means of such ceremonies, has been conclusively fixed and dedicated, the female usually remains in the nest to build and fashion it while the male goes off to seek straws and fetch them to her. Each time he returns with a straw there is a little exchange of caresses between the two birds, and either may at this time sound the nest-call. The song or perch-coo also is given during this period of site hunting and nest building, but the song is far less frequent than the nest-call, and of course is not given in the nest. Nest-calling and its accompanying ceremonies continue unabated until the female enters the nest to lay her first egg; then they are dropped rather suddenly, giving place

to a new and different order of ceremonies, those connected with incubation.

Throughout the period when the birds are busy dedicating and building the nest, they are busy also with copulation. The sexual act comes only as the culmination of prolonged preliminaries. The caressing and cooing and nest-calling already mentioned all tend to excite the birds; when thus excited, they both show their eros by a certain spasmodic plucking of the inner sides of the wing quills, often referred to briefly as "preening inside the wing"; the female may even beg from the male in very much the same fashion as the young begs from the parent. Finally they bill, the female putting her beak into the mouth of the male and apparently receiving a little food thrown up by him from his crop. After billing, the female squats, the male mounts, copulation is performed, and then the copulation-note as already described (p. 400).

The interval which must elapse between the first copulation and the laying of the first egg, is in the Blond Ring-Dove about 6 days; in the Mourning Dove it may perhaps be a little less. In the case which I am now narrating the female laid her first egg on July 15, some time between 3:45 and 4:30 P. M.; and her second egg July 17, at 7:50 A. M. One egg hatched July 30, early in the morning; the other egg failed to hatch. Male and female take regular daily turns in sitting on the eggs or young: the female sits from evening till morning, the male from morning till evening, the exchanges taking place usually about 8:30 A. M. and 4:30 P. M. This arrangement is very regular if there is nothing to disturb the birds; but if interloping birds come about, this arouses the anger of the male and he leaves the nest in order to attack them.

During the period of incubation and brooding, the doves are comparatively quiet; in fact their whole temperament is fundamentally altered. Either male or female, when on the nest incubating or brooding, is fearfully quiet, always on the lookout for danger, feathers all appressed, body held low and rigidly still. Yet I have known the female when sitting, to sing her feeble song in answer to her mate; and, each time the sitting bird is relieved by its mate, there is an exchange of little marks of affection, such as flipping the wings, preening the head of the mate, and sometimes a quiet, subdued nest-call. When off and away from the nest,

either bird is much more free to move about and make a noise; of course they are much more quiet during incubation than in the days of courting; but each evening throughout the incubation period, the male on his roost, which is always some distance from the nest, serenades his sitting mate with the song or the nest-call, repeating one or other of these every few minutes as the day wanes. Zenaidura is a vesper bird; as compared with other doves, he sings less in the morning and relatively more in the evening.

Comparative quiet thus reigns during the whole time of incubating and brooding. But when the young are more or less fledged, the parents begin once again to become wooers. The song and the nest-call are redoubled, and the male begins once again to charge the female and to pluck his wing quills from the inner side. Thus is inaugurated another brood cycle which passes through the regular round of laying, incubating, brooding and rearing the young. These brood cycles continue to follow one another until the latter part of the summer, when the molt approaches; then as the birds finish the task of rearing the last brood they do not warm up to the work of starting another. The merry play of singing, nest-calling, and charging does not reappear until the following spring. It is said that in winter, even the vocal organs of the Mourning Dove dwindle to an insignificant state.

References.

Craig, Wallace. 1908. The voices of Pigeons regarded as a means of social control. *Am. Jour. Sociol.*, Vol. XIV, pp. 86–100.

Craig, Wallace. 1909. The expressions of emotion in the Pigeons. I. The Blond Ring-Dove (*Turtur risorius*). *Jour. Comp. Neur. and Psych.*, Vol. XIX, pp. 29–80, one pl., 1909.

Gates, Wm. H. 1909. A few notes on the habits, life history and economic value of Doves. *Bulletin No. 14, Gulf Biological Station, Cameron, La.*, pp. 3–27.

THE EXPRESSIONS OF EMOTION IN THE PIGEONS. III. THE PASSENGER PIGEON (*ECTOPISTES MIGRATORIUS* LINN.).

BY WALLACE CRAIG.

INTRODUCTION.

IF the Passenger Pigeon is not yet extinct, it is highly important that there be published an account of its peculiar voice, for this may be of great assistance in re-discovering the birds. Thus, if you tell a boy to look for a bird of the same general appearance as the Mourning Dove but larger, he will be sure to mistake some large-appearing Mourning Dove for the Passenger Pigeon. But tell him to look for a pigeon that shrieks and chatters and clucks instead of cooing, and the boy will be less likely to make a mistake. The voice has this further advantage as a mark of identification, that it cannot be produced in a dead bird, and thus forms an incentive to keep the bird alive.

If the species is extinct, it is equally important to publish whatever is known of its voice, as a matter of permanent record. The Passenger Pigeon is well known to have been a unique species in one respect — its prodigious gregariousness. But the fact is that it was a marked bird in every respect. Ectopistes represents a line of evolution which has diverged widely, in habits at least, from the main paths of Columbine descent. Its voice was more distinctive than that of any other species in Professor Whitman's large collection of living pigeons from all parts of the world. This marked peculiarity of the species makes it infinitely regrettable if the whole race, through sheer wantonness, has been annihilated.

The accounts hitherto published of the voice and mating behavior of the Passenger Pigeon are meagre, largely incorrect, and totally inadequate for that detailed comparative study which scientific considerations demand. The best life-history, so far as concerns the mating behavior, is probably that of Bendire (quoted largely from Wm. Brewster), but even this, as is seen in the very manner of its composition, is fragmentary. Mershon has done a great

work in collecting scattered records of the species. But accounts of its voice and gestures are especially scarce. Wilson, for example, makes only this brief statement on the subject: "They have the same cooing notes common to domestic pigeons, but much less of their gesticulations." Even this last brief clause, however, is of value to countervail Audubon's florid description. Audubon has more to say than any other writer on the voice and gestures of the species, but his account is so full of errors that at the end of this paper (p. 423) I shall criticise it in detail. A criticism of the figures on Audubon's plate will follow the discussion of his text, and a criticism of other published figures will be found on pp. 411, 412.

The present study of the expressions of the Passenger Pigeon is also inadequate and, I fear, also incorrect in some details; all that can be said is, that I have made it as truthful and as adequate as I can. I saw this bird in a wild state only once to my knowledge, in Chicago in 1891,[1] as recorded by my late lamented friend Dr. Dunn (Dunn, 1895). My studies of the voice of the species were all made in Professor Whitman's aviary, chiefly in the year 1903, a year which was too late to see much of the vanishing birds, yet too early in my own study for me to have a good grasp of the problems. For Professor Whitman's aviary contained that summer no Passenger Pigeons in full breeding operation, but only a few unmated birds, one male mated with a female of his own species, one mated with a female Mourning Dove, and one mated with a female Ring-Dove, none of these mated birds carrying their breeding operations to completion. And as for a grasp of the problems, suffice it to say that science has not yet reached the point where it can well understand and record the language of any bird. My notes were not published when first taken, because they were felt to be so inadequate; now, after several years further study of doves, I can better understand the facts concerning the Passenger Pigeon, but I have forgotten many details. Hence, the following notes are put forth, not with the assurance that they adequately represent the repertory of this remarkable species, but only with regret that the meagre information now to be given is all we are likely to have on the subject.

[1] This occurrence of the species has been overlooked by Mershon in his list of occurrences.

A. THE FORMS OF EXPRESSION.

General Bearing. As I have said, the Passenger Pigeon had in every respect an individuality which marked it off from the other species of the family, an individuality which stood forth in walking, flying, and every other activity, and even when the bird stood silent and still on the perch. Professor Whitman says, in a published letter (Mershon, p. 199): "Of all the wild pigeons in the world the Passenger Pigeon is my favorite. No other pigeon combines so many fine qualities in form, color, strength and perfection of wing power." And chief Pokagon says (Mershon, p. 49): "It was proverbial with our fathers that if the Great Spirit in His wisdom could have created a more elegant bird in plumage, form, and movement, He never did." The bird was a majestic, muscular, trim body; it consisted of a splendid chest and wings, contrasting with rather short legs and small head, and tapering gradually into the long, slender tail. It was eminently a bird of flight; on the ground, it was rather awkward for a pigeon, its legs seeming too short and its massive shoulders too heavy. In regard to this, as in regard to all other points where practicable, I shall transcribe original notes verbatim.

"All important sounds given on perch or nest, they do nothing on ground but feed, female sometimes making angry noise when quarrelling over food, but I have not known male do even that."

In contrast to this lack of ease on the ground, is the ease and nobility of the Passenger Pigeon when flying and also when perched aloft. When sitting on a perch in the aviary the male often indulged in a grand wing exercise, an impressive display totally different from the fluttering exercise of the other species of pigeon.[1]

"August 1. Male often sits on perch or on ledge and flaps his wings for long time preparatory to flight, looking about him attentively as he does so. For a small part of the time, especially just at the beginning of each series, wings may be held up without being spread, and very slightly flapped; again, they may be fully spread and flapped with the fullest amplitude, the carpi coming within about $1\frac{1}{2}$ inch over the back. The

[1] I find that I made note of a similar wing exercise once in the Homing Pigeon, and once in the Rock Dove, *Columba livia.*

only reason this flapping does not lift the bird is that it is not rapid enough, also the bird seems to hold tightly to perch with its feet. As it is, the whole body, head and tail rise and fall with each stroke. He generally stands obliquely along the perch, so that one wing comes down on each side of perch, but even then it often happens that one wing hits the perch with very audible sound at every stroke."

This wing flapping seems to have been not merely an exercise but also a display, more or less connected with mating, for it was seen chiefly in the breeding season.

The nod of the Passenger Pigeon was utterly different from that of the Mourning Dove. The specific manner of nodding seemed an integral part of the bird's general bearing. The nod consisted of a movement of the head in a circle, back, up, forward, and down, as if the bird were trying to hook its bill over something. Often two or three such nods were given with no pauses between, following one another much more rapidly than in the Mourning Dove, because body and tail remained all the while stationary. Thus the nod, being performed by the head alone, fell in with the general mannerism of the species — the body generally executing strong and ample movements, the short and quick glances and nods being executed by the head alone.

To this general account of the bird's bearing, I may append the following scraps of notes, which, in case the species is really extinct, may prove of interest when our bird biographies become more complete than they are now.

"Ordinary walking pace of male, 12–13 steps in 5 seconds."

"In eating, female pecks at rate of about 12 pecks in 5 seconds on an average, and as head moves through considerable arc, its motion is very quick. The mumbling of each seed, also, is very quick."

"Especially active and noisy in early morning."

The general bearing of this species ought to be shown in the extant drawings of it, but this has been done with varying success. I have seen only five published plates representing the live Passenger Pigeon. Of these, the best to show the form and carriage of the species is the photograph of a young bird, by Professor Whitman (Mershon, facing p. 198). Fuertes's figure of the male (Mershon, frontispiece) is a life-like portrait of this bird in an attitude of alarm or anxious attention; the figure of the female in

this same plate is less representative. Wilson's figure (the one reproduced in Coues's 'Key'), though faulty in many particulars, gives one a general impression of strong, massive body, strong wings and shoulders, short legs and small head, all which is truly characteristic. The figures in Baird, Brewer, and Ridgway (Vol. III, p. 369) and in Audubon, as attempts to show the bearing and mannerism of the species, are quite worthless. (A detailed criticism of Audubon's plate is given on p. 425.)

Enmity. The male Ectopistes was a particularly quarrelsome bird, ever ready to threaten or strike with his wings (though perhaps not quite so ready with his beak), and to shout defiance in his loud strident voice. With such a quick temper, such a grand air, and such an unusual voice and method of attack, he generally put to flight a pigeon of any other species at the first onslaught. Nevertheless he was a coward at heart. In short, he was a splendid bluffer.

This is true of all pigeons to a greater or less degree. Most species of pigeon have two methods of fighting: the first, a hostile display or ceremony; the second, actual physical combat. Ceremonial fighting is the most frequent: the contestants make a great show and a great noise, talking and cooing, bowing and strutting, threatening with wings and beak, and generally deciding the quarrel by these means, the less determined party giving in without being hurt. When both sides are determined, however, they pass from this ceremonial fighting into a fierce physical struggle, in which there is no strutting, no ceremony, no crying out, but only the flutter and thud of fighting, and an explosive clapping of angry wings. The pigeon cannot kill his enemy at a blow, as the cock can, for he has no special weapons and his beak is soft, but he can worry his enemy grievously and in time perhaps worry him to death.

Now as to the Passenger Pigeon, he seemed, so far as I knew him, to have but one method of fighting, which was intermediate between the two described. He was an aggressive, violent threatener, but not a real fighter. He would even flee from a Geotrygon, a bird not half his size, as the following extract shows.

"July 25, 1903. A male Passenger Pigeon alighted on ground, was attacked by Geotrygon, chased for several jumps, and finally compelled

to fly up. Again, a Geotrygon flew down beside a male Passenger on a shelf, and drove him off the shelf simply by going at him with one wing up. A Geotrygon actually drove a male Passenger off his own nest."

The following incident in the life of a male Passenger Pigeon mated with a female Ring-Dove shows that the former was less brave than the latter in driving intruders away from the nest. (In pigeons generally the male is at least as brave as the female in this matter.)

"July 14, 1903. This morning I found a European Wood Pigeon (*Columba palumbus*) on the nest beside the female Ring-Dove, and a female Passenger in adjacent corner. The male Passenger came in and drove off the interloping female Passenger, then sat in corner quiet. Occasionally he threatened the Wood Pigeon with wings and voice, but dared not go at him. The female Ring-Dove threatened and finally pecked the Wood Pigeon, making him start and throw a wing up. Then the male Passenger flew at him and drove him off."

Had it not been for this comparative harmlessness, the Passenger Pigeons surely could never have nested so close together as they did — a hundred nests in one tree, as both Audubon and Wilson testify. Most pigeons are too aggressive to admit of such neighborliness.

Fear and Alarm. Probably the Passenger Pigeon did not differ greatly from other species in the expressions of fear and alarm, for these are the most uniform expressions throughout the Columbidæ. Chief Pokagon writes as follows (Mershon, p. 50): "While feeding, they always have guards on duty, to give alarm of danger. It is made by the watch-bird as it takes its flight, beating its wings together in quick succession, sounding like the rolling beat of a snare drum. Quick as thought each bird repeats the alarm with a thundering sound, as the flock struggles to rise, leading a stranger to think a young cyclone is then being born." This habit of flying up when the flapping of wings is heard, was taken advantage of by the pigeon-catchers in managing the flock, thus: (Brewster, 1889, quoted in Mershon, p. 75): "After a portion of the flock has descended to the bed, they are started up by 'raising' the stool bird [the stool bird then flapping its wings], and fly back to the perch." The communication of alarm by the sound of wings is seen clearly in all species of pigeon. The Passenger probably had

also an alarm-note resembling that of the other species, but of this I have no record.

The Charge. I believe, but am not certain, that the charge, as described for the Ring-Dove and Mourning Dove (Expressions in Pigeons, I, p. 42, and fig. 2; II, p. 400) is not represented in Ectopistes at all. This much is certain, that Ectopistes was more awkward on the ground than are most pigeons, and if it charged or strutted in any manner it did not indulge this habit so much as most pigeons do.

The Kah and the Coo in general. The cries of the Passenger Pigeon which seem to represent the kah and the coo of other species, are identified with those rather by the circumstances under which they are given than by the character of the cry itself, so far have they diverged from the usual type. Some of these cries, the homology of which is uncertain, had better be described under names invented for Ectopistes alone rather than under those names which apply to the Columbidæ in general. The terms used will be the following: 1. The copulation-note; 2. The keck (a name not used for the note of any other species); 3. Scolding, chattering, clucking (these names also peculiar to the species); 4. The vestigial coo or keeho; 5. The nest-call.

The Copulation-note. This note is essentially the same as in the Mourning Dove, and will be described in the course of the life-history (p. 421).

The Keck. This word is an imitation of the cry for which it stands. The first *k*, however, should be aspirated like the German *ch*, to represent the unmusical quality of the cry. The sound is loud, sometimes very loud, harsh, and rather high-pitched (*b* above the treble staff) so far as it can be said to have any pitch at all. It is generally given singly, but sometimes two or more in succession with but short pause between. It is quite unlike any sound I have heard from other species of pigeons. In its use it is, as it were, a loud shout, which commands attention and tends to overpower the bird at which it is directed. It is used both to overpower the female and to overpower an enemy. Hence it would seem to correspond to that expression of the Ring-Dove which I have named the kah-of-excitement (Expressions in Pigeons. I, p. 40). The keck resembles the kah-of-excitement also in that it is often followed immediately by other notes, such as the coo.

"Sometimes with each kheck wings are raised to full extent and flapped once. Often bird is a little oblique on perch so that one wing-tip strikes down in front of perch, the other behind; but sometimes bird is square and both wings come down in front.

"Have seen male give this wing-flap to female without a sound."

"One gave a loud keck and flap of wings at a Turtle-Dove who was bowing-and-cooing on a shelf two feet below him: the Turtle stopped his bowing-and-cooing.

"The Passenger did the same at a Wood Pigeon (*Columba palumbus*)."

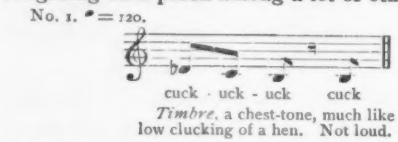
Scolding, Chattering, Clucking. These words are chosen to represent the wide variations of this most characteristic and frequent utterance of the Passenger Pigeon. Similar descriptive words have been used by all who have attempted to treat the voice of this species. Thus Audubon says (Orn. Biog., I, pp. 325, 326): "The common notes resemble the monosyllables *kee-kee-kee-kee.*" Other writers, quoted by Mershon, speak of the sounds as "chattering" (pp. 51 and 166, 167), "twittering" (p. 84), "chirping" (p. 85), "*Tete! Tete! Tete!*" (p. 138), and finally the "crowing call of the wild pigeon" (p. 157). Wm. Brewster (quoted in Bendire, p. 134) says: "They make a sound resembling the croaking of wood-frogs." A vivid idea of the sound may be gained from the following account by H. T. Blodgett (in Mershon, p. 120): "During the spring and also the fall visit, flocks searching for feeding ground could be called down from flight and induced to light on trees near where the call was sounded. The call was one in imitation of the pigeon's own call, given either as a peculiar throat sound (liable to make the throat sore if too often repeated) or with a silk band between two blocks of wood . . . .held between the lips and teeth and blown like a blade of grass between the thumbs. By biting or pressing with the teeth . . . .the tension upon the silk band would be increased, raising the tone of the call or relaxing for a lower note. Cleverly used, it was very successful in calling pigeons feeding in small flocks to alight."

This cry is used in a great diversity of circumstances, it is directed both toward the mate and toward enemies, and in varying situations the utterance varies to an extreme degree. In expressing high excitement it becomes loud and high-pitched, and in the excitement of fighting especially it becomes very rapid. In a gentle mood, it subsides into a soft, low-pitched adagio. Hence,

although the tone is never musical the cry is highly expressive, just as the tones of voice in speaking and shouting are expressive. This utterance is probably analogous to the ordinary *kah* of the Ring-Dove, which, you will remember, has no analogue at all in the Mourning Dove.

The following notations (Nos. 1–20) of the scolding, chattering and clucking of the Passenger Pigeon, I made as accurately as I could by ear, in Professor Whitman's aviary.

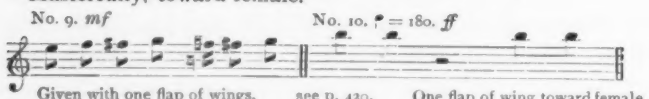
Alighting on a perch among a lot of other birds.



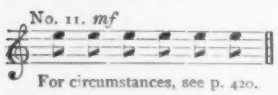
Timbre, a chest-tone, much like the low clucking of a hen. Not loud.

Fighting. Quarreling.

Masterfully, toward female.

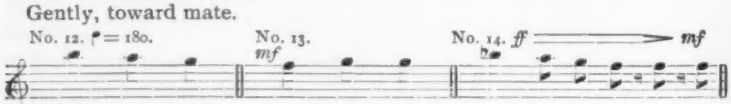


Given with one flap of wings, at a female on perch. see p. 420. One flap of wing toward female with each double note.

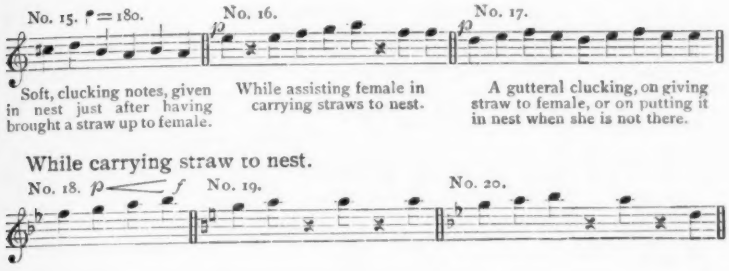


For circumstances, see p. 420.

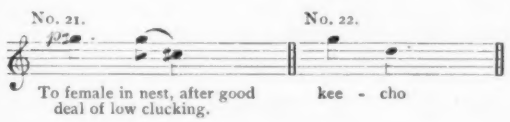
Gently, toward mate.



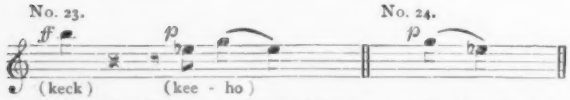
Given by male when just about to tickle female's head. Given on alighting on nest when female there. For circumstances, see p. 420.


No. 15. ♩ = 180.
No. 16.
No. 17.
Soft, clucking notes, given in nest just after having brought a straw up to female.
While assisting female in carrying straws to nest.
A gutteral clucking, on giving straw to female, or on putting it in nest when she is not there.
While carrying straw to nest.
No. 18.
No. 19.
No. 20.

The vestigial Coo, or the "Keeho." The notes which have just been described, were, as said, the most frequent and the most characteristic utterances of the Passenger Pigeon. But not uncommonly when the bird is kecking and clucking he lapses into a weak, somewhat musical strain sounding like *keeho* or some such dissyllable. This is no doubt a vestigial coo. It resembles the coo in sound, and also in the circumstances under which it is uttered, for it is given *after* the more unmusical notes, both in dealing with an enemy and in wooing the female. I call it vestigial, a mere remnant of a coo, for several reasons: its sound is feeble and lacking expression; in function it seems unimportant, coming usually after or among the stronger, more expressive utterances; finally, the manner of its utterance gives the impression that it is somewhat less voluntary, less under the bird's control, than are some other notes of this species or the coos of other species. One sees in this probably an adaptation to life in a community so populous and hence so noisy that cooing could hardly be heard and the pigeon which could best win a female or warn off an interloper would be the pigeon with the merely loudest voice. In this ultra-gregarious species, the soft note, the coo, has degenerated; whereas the hard cry, the kah, has been developed and intensified into the loud sounds of kecking, clucking, chattering and scolding. The following notations (Nos. 21–26) illustrate the vestigial coo.



No. 23.



Before giving this, gave keck several times, each time raising wings and closing again suddenly. Once gave a flap of wings forwards.

No. 24.

Also given after a few kecks (even if the kecks are at an intruding bird.)

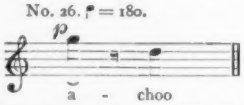
On another occasion, given alone, not preceded by kecks.

On one occasion, given near nest, after driving other pigeons away.

No. 25.

After a number of loud kecks, each accompanied by a flap of wings.

No. 26. ♩ = 180.



Both clear tones; the first, hard like squeak of violin; the second softer, a head-tone. The slight intermediate ch is toneless.

Altogether, quite musical.

The Nest-call. The nest-call, of which I have only one carefully recorded observation, resembles that of the Ring-Dove and Mourning Dove in the general use to which it is put and in the movements which form part of the expression. The sound is totally unlike that heard from Ring-Dove and Mourning Dove, but bears a general resemblance to the nest-call cooing of the Japanese Turtle (*Turtur orientalis* Lath.) and the European Turtle (*Turtur turtur*), which Professor Whitman believed to be the nearest living representatives of the ancestral type of the whole group.

No. 27.

Timbre very much burred — more so than any other note of this species. A great mixture of high and low tones. Only moderately loud, and half musical.

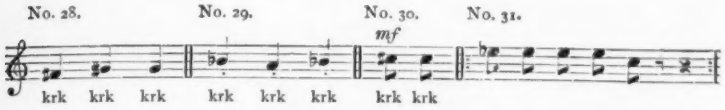
Series consists at the least of about 8 notes, and at the most of a large number. If a long series, it falls a little in pitch, about a semitone. Series always ends with a *keeho*.

Bird stood in nest, with tail up and head down, though not so much tilted as some other species. He was never at rest, always in slight nervous motion.

In much the same position, bird gives a series of *keeho* without the nest-call burred note. With the first note of *keeho* head is raised a good deal above the back, and lowered with second note.

The Voice of the Female. All that has been stated thus far regarding the voice of the Passenger Pigeon, refers to the male

only.[1] In this species, as in all other pigeons, the female is comparatively a very quiet bird. The following few notes (notations Nos, 28–31) are all I have on the voice of the female.



No. 28, not loud, a clucking sound. Given on alighting on perch among Band-tailed Pigeons who drove her off.

No. 29, similar to the preceding. Given in striking at a dove and driving it off perch.

No. 30, an almost toneless croak. Uttered at a male whom she wished to drive off. Once heard a male give a very similar note toward a female.

No. 31, an almost toneless croaking sound, like the rolling of an *r* in one's throat. Uttered at another bird in quarrelling over food. Repeated several times. Another day I heard the same utterance given under the same conditions, but 6 notes instead of 5, and a considerable resonant tone with the hoarseness, being *mf*.

Once I heard a female give, at the end of a series of clucks, in the nest, a feeble counterpart of the male's keeho.

B. The Expressional Life-History.

The life-histories of all pigeons are very much alike; that of the Passenger Pigeon is in general, and even in most of its details, a counterpart of the life-history of the Ring-Dove or the Mourning Dove, as described in the two preceding papers of this series. However, there are many details in the life of Ectopistes which are not found in any other pigeon, and if we had known the species more fully we should probably have found many peculiarities of habit which are now not known at all. I am by no means able to give a complete life-history of the species, but I shall give all my observations on the uses of the various cries and gestures in the mating and general social life of the species.

The wooing of the Passenger Pigeon is very different from that of most other species. There is no bowing as in the Turtles, Ring-Doves, etc., no strutting as in the Domestic Pigeon, and I doubt whether the charge was practised as in the Ring-Doves and Mourn-

[1] Except musical score No. 1, which I suspect may have been recorded from a female.

ing Dove. The male Passenger Pigeon, when displaying near the female, used the *keck*, often accompanied by a single sweep of the wings, also the loud chattering notes and the soft *keeho*, and sometimes the grand wing exercise (p. 410).

"Once when male was caressing female [on a day of copulation] and she flew away from him to next perch, he looked at her, fighting attitude, and gave call No. 10 (p. 416), flapping his wings at her."

When close beside the female, the male Ectopistes had a way all his own of sidling up to her on the perch, pressing hard upon her, sometimes putting his neck over her neck, "hugging" her, as Professor Whitman expressed it.

"July 18. Male presses over on perch against female, gives *keck* twice without raising wings, then preens inside wing [a sign of eros]."

"July 31, 1903. A male is following a female about. Whenever he alights beside her he presses close to her, head held as high as possible and directed toward her. She moves off each time and he sidles along and presses her again and again. This very characteristic of the Passenger Pigeon."

Cry No. 11 (p. 416) was "given to mate, after several kecks and light, swift taps with the wings. The performance looked like fighting, but it was not. The birds sharply and roughly preened each other."

Cry No. 14 (p. 416). "Male alights beside female [on a day of copulation], presses so close as to make her move several steps along the perch, and as he does so gives cry No. 14."

When the female becomes amorous, instead of edging away from the male when he sidles up to her, she reciprocates in the "hugging," pressing upon the male in somewhat the same manner that he presses upon her. These peculiarities make it far more difficult for the breeder to cross the Passenger Pigeon with other species than it is to cross many of these other species *inter se.* Thus, one of Professor Whitman's attempts to mate a female Passenger Pigeon with a male homer (*Columba livia* var.) failed because when the female had been played up to until she was amorous she began to reciprocate by sidling up to the male, wanting to press him and hug him, he took this for just so much pugnacity every time, and edged off, with the result that they never mated. In general the Passenger Pigeons are very rough in their caressing. When a male Passenger is mated with a female Ring-Dove, instead

of preening her feathers gently as the male Ring-Dove usually does, he preens her so roughly that she is frightened and edges off from him.

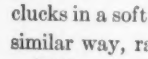
The act of billing, which occurs in all pigeons before copulation, is in Ectopistes reduced to a mere form. In the Ring-Dove, the male opens his mouth, the female puts her bill into it, then follows a pumping movement in which the male seems to be actually feeding the female; then the pair leisurely disconnect, mumble their mouths as if they had a sweet taste in them, and soon bill again in the same careful manner. But in the Passenger the bills are quickly clasped, shaken for a fraction of a second, and as quickly separated; the performance is precisely like a brief, quick handshake. It is probable that there is no passing of food from one mouth to the other. This perfunctory mode of billing, again, causes some difficulty in crossing the species: for example, if a male Passenger is mated with a female Ring-Dove, when they are leading one another up to the point of copulation, the male bills in his abbreviated fashion and immediately wishes to mount, but the female is not yet ready, she is trying again to bill.

With regard to the manner of copulation, I made the following note on July 24, 1903.

"Each time they copulate, female stands up very straight when male mounts; this compels him to flap his wings for long time, scrambling up near her neck, till she becomes tired [?] and sinks down, then he copulates."

I cannot say whether this procedure is invariably followed, but if so it is peculiar to the species and in keeping with their generally rough manner of wooing. This scrambling of the male on the back of the female is probably a stimulus which serves the same function as the protracted billing in other species.

With regard to the *copulation-note*,

(July 24, 1903.) "After copulation, male takes a position somewhat like that of fear (fighting), head drawn in and feathers puffed out, and clucks in a soft toneless voice  . Female clucks in somewhat similar way, raises wings and strikes male with them two or three times.

"After copulation this evening (7:20 P. M., dusk) both stand up straight and tickle each other's heads with nervous rapidity for several seconds."

In all this, the only act at all peculiar to the species is that of the female striking the male with her wings.

Choosing a nesting-site, carrying twigs and straws to it, and building the nest, are done, as in other pigeons, by male and female in coöperation, with a good deal of ceremony — caressing, cooing, etc. The following contains the gist of my notes on the subject.

"Female sits in nest and builds it, while male fetches straws to her. He leaves nest and hunts for straws silently, but having found the straw he gives a few kecks on starting, and a few whenever he perches on the way, or when he arrives at nest." Another note reads: "When flying up with a straw he gives a series of notes rising to high pitch and intensity. No. 18 [p. 417] is typical." But in this case he may have been unusually excited, for the pair were in a state of indecision as to which of two nests to use.) On giving straw to female, or putting it in nest when she is not there, he makes a guttural clucking (No. 17, p. 417).

"July 18. Female, in nest with male, gives sound like *kŭ-ss*, *kŭ-ss*, *kŭ-ss*, *kŭ-ss*, in which the first note of each pair is a low cluck, and the second a high squeak."

Ruthven Deane (1896, p. 235), quoting the owner of some captive birds, says: "The females remained on the shelf, and at a given signal which they only uttered for this purpose, the males would select a twig or straw . . . .and fly up to the nest." No doubt the birds do stimulate one another to work, but there is no such definite "signal."

The Passenger Pigeon, like other species, shows intense jealousy throughout the period of wooing and nest-building, quarrelling with any outsider who comes near mate or nest. After the egg is laid, jealousy in regard to the mate ceases, but the jealousy which guards the nest of course continues. Hence, in the old densely populated breeding grounds the noise of quarelling must have been frightful. Brewster, in speaking of the old colonies, says (quoted by Bendire, p. 134): "Pigeons are very noisy when building . . . . Their combined clamor can be heard four or five miles away when the atmospheric conditions are favorable." This condition would seem sufficient to explain the peculiar voice of the species — the emphasizing of loud, piercing tones, and the comparative disuse of the soft notes.

The number of eggs laid by Ectopistes has been the subject of much controversy. Professor Whitman assured me that the female of this species lays only one egg. Morris Gibbs is undoubtedly

correct when he says that each female lays but one egg, and that when two eggs or two young are found in the same nest, the two came from different females. In any species of pigeon it might happen that two females should lay in the same nest, but in the Passenger Pigeon this occurrence seems to have been unusually frequent, which is one of several facts going to show an unusual degree of neighborliness in this species.

Another line of evidence going to show an unusual degree of neighborliness in the breeding of this species, is that of the feeding of orphans. Chief Pokagon says (Mershon, pp. 52, 53): "It has been well established that these birds look after and take care of all orphan squabs whose parents have been killed or are missing." E. T. Martin says (Mershon, pp. 102): "In proof of the pigeons feeding squab indiscriminately [this word is surely an exaggeration], I may mention the fact that one of the men in my employ this year . . . .in one afternoon shot and killed six hen pigeons that came to feed the one squab in the same nest." And Chief Pokagon again (Mershon, p. 206): "I have seen as many as a dozen young ones assemble about a male, and, with drooping wings, utter the plaintive begging notes to be fed, and never saw them misused at such times by either gender." It is true of the domestic pigeon, for example, that a parent may occasionally, if importuned, feed a young one not his own, but it is also true that a young one may be pecked and driven off if it begs from strangers. Hence, if the above-quoted observations on the Passenger Pigeon are correct, they indicate a solicitude for orphans which is probably unique among pigeons.

At the end of the breeding season, the Passenger Pigeon, like other pigeons, becomes a comparatively quiet bird. Beginning early in August, one notices that the birds are not only less amorous but also less quarrelsome: the kecking and scolding and the grand wing exercise become less frequent, less prolonged, and less intense; the *keeho* seems to disappear altogether for a time. But early in the following year, possibly even in January, the flock re-attains its maximum vociferation.

As was said before (p. 409), I purpose now to criticise Audubon's account of the expressions of this bird. Audubon did a great work, a work of foremost value in the history of American orni-

thology. He was a pioneer — but pioneer work is necessarily rough and imperfect, and some of it must of course be superseded. It would be a mistake, especially in the case of an extinct species, to let incorrect statements stand, no matter how deeply we may venerate their author. I shall quote all that Audubon says (Ornithological Biography, I, pp. 319–326) upon the expressions and mating habits of the species, and shall correct it where known to be wrong. He begins by describing a certain mode of nuptial flight, said to be very similar to such flight in the domestic pigeon; unfortunately, the birds in Professor Whitman's aviary could never be allowed outside and hence had no opportunity to display such flight. After describing the nesting-places, Audubon then proceeds: "At this period the note of the pigeon is a soft *coo-coo-coo-coo*, much shorter than that of the domestic species. [This probably refers to what I have called the *keeho* or vestigial coo.] The common notes resemble the monosyllables *kee-kee-kee-kee*, the first being the loudest, the others gradually diminishing in power. [Not always so inflected. Corresponds to the "scolding," etc., in the present paper.] The male assumes a pompous demeanor and follows the female whether on the ground or on the branches, with spread tail and drooping wings, which it rubs against the part over which it is moving. [?] The body is elevated, the throat swells [? probably this is assumed by analogy from other pigeons], the eyes sparkle.... Like the domestic pigeon and other species, they caress each other by billing, in which action, the bill of the one is introduced transversely [wrong] into that of the other, and both parties alternately [wrong. In no species of pigeon does the female feed the male.] disgorge the contents of their crop by repeated efforts. [Probably there is no disgorging, even by the male, in this species.] These preliminary affairs are soon settled, and the pigeons commence their nests in general peace and harmony. [On the contrary, there must have been ceaseless quarrelling.].... The eggs are two in number. [Undoubtedly wrong.]....During incubation, the male supplies the female with food. [Not true.].... It is a remarkable fact, that each brood generally consists of a male and a female. [Impossible, since there is only one egg.]" The last statement is manifestly carried over from the domestic pigeon, and even of this species it is not so true as is generally supposed,

but is an old, old belief, dating back at least to Aristotle. Thus, when we examine Audubon's account of the expressions of the Passenger Pigeon, we find that it came largely by reasoning by analogy from the domestic pigeon and from the author's charming but somewhat unscientific imagination; so much so as to cast a shadow of doubt over other statements which we cannot now verify.

For the sake of our knowledge of this species, Audubon's figures, just as his text, need to be criticised. The plate (Birds of America, Vol. I, pl. lxii, portrays a male and a female Passenger Pigeon in the act of billing, the female sitting on a separate perch, so high above the male that they can just reach one another. But in truth the birds when billing are always side by side; whenever they wish to bill, they sit side by side and caress one another first. The artist evidently intended to represent a female passing food to the male. But this never happens; if any food is passed at all it is from male to female. Coupled with this is the fact that the begging attitude in which Audubon has drawn the male, belongs to the female only among pigeons (and not even to her, I think, in the Passenger). Nor should the tail of the male be spread. As to the bills, the drawing is correct in that it shows the bill of the female inserted into that of the male, but wrong in showing the female's bill inserted "transversely," as the text has it. The fact is, that as the two birds sit side by side in billing, their heads are both in normal position, the upper mandible being uppermost. Thus we see that, however great the value of this plate in other respects, its value as a record of the attitudes and habits of the species, is very little. (Mention of other published figures was made on p. 411).

A word as to the care of Passenger Pigeons, in case we may be so fortunate as to find some still living. Professor Whitman kept his in the same pen with other species, supplied with the pigeon staples of mixed seed, grit, oyster shells, salt, and plenty of green food such as lettuce. After he had had his flock many years, he discovered that they would greedily devour earthworms, and when abundantly supplied with this delicacy the birds improved so much in health and vigor that Professor Whitman thought if only he had known of this diet early enough he might have saved his stock from dying away.

SUMMARY OF PECULIARITIES OF THE SPECIES.

It has been shown in this paper that the Passenger Pigeon was as peculiar in voice and gesture and social life as it was in its habits of flocking and migrating. Even its attitude and movements when standing on a perch, were highly characteristic of the species, seeming to be correlated with its high adaptability for flight. It was comparatively awkward on the ground, and hence was less given to strutting and charging than are other pigeons. On the other hand, it indulged in a grand wing exercise all its own.[1] Its voice was loud and strident, the hard notes being predominant and the musical notes somewhat degenerated, this being probably the result of its living and breeding in colonies so populous that only the loudest sounds could be heard. It was a bluffer in fight, quarrelling much, but having neither much power to hurt the enemy nor much bravery in withstanding his attacks. It suffered intruding pigeons to approach its nest as few other species would do. Its manner of courting was distinctive, characterized by much physical contact and roughness; the gentle ceremony of billing was reduced to a brief, quick contact. All these peculiarities seem to hang together, making a consistent character. And all seem connected, directly or indirectly, with the extreme gregariousness, the breeding in vast colonies.

References.

Audubon, J. J. Birds of America, Vol. I, pl. lxii.
" Ornithological Biography. Edinburgh, 1831–39, Vol. I, pp. 319–327.

Baird, Brewer, and Ridgway. 1905. (1874). North American Land Birds. Boston. Vol. III.

Bendire, Charles. 1892. Life Histories of North American Birds. Washington, Smithsonian Institution. (Part I.)

Brewster, William. 1889. On the present status of the Wild Pigeon, etc. *The Auk*, Vol. VI, pp. 285–291. (Quoted in Bendire and in Mershon.)

Craig, Wallace. 1909. The Expressions of Emotion in the Pigeons. I. The Blond Ring-Dove (*Turtur risorius*). *Journ. Comp. Neurol. and Psychol.*, Vol. XIX, 1909, pp. 29–80, one pl.

[1] But see note added to p. 410.

Craig, Wallace. 1911. The Expressions of Emotion in the Pigeons. II. The Mourning Dove (*Zenaidura macroura* Linn.) *The Auk*, Vol. XXVIII, 1911, pp. 398–407).

Deane, Ruthven. 1896. Passenger Pigeon. *The Auk*, Vol. XIII, pp. 234–237. (Reprinted in Mershon, pp. 200–204).

Dunn, J. O. 1895. The Passenger Pigeon in the Upper Mississippi Valley. *The Auk*, Vol. XII, p. 389.

Gibbs, Morris. 1894. Nesting Habits of the Passenger Pigeon. *The Oologist*, Vol. XI, 1894, pp. 237–240. (Reprinted in Mershon.)

Mershon, W. B. 1907. The Passenger Pigeon. New York. Pp. xii + 225. Contains reprints and also original matter by many authors, including Gibbs, Pokagon, Brewster, E. T. Martin, Blodgett, Whitman.

Wilson, Alexander. American Ornithology. Many editions. Art. "Migratory Pigeon."

OTHER EARLY RECORDS OF THE PASSENGER PIGEON.

BY ALBERT HAZEN WRIGHT.

(*Concluded from page 366.*)

Pennsylvania, New Jersey and Delaware.

In 1634, Capt. Thomas Yong, in his 'Voyage to Virginia and Delaware Bay and River,' found[1] "infinite number of wild pidgeons" in the latter region. Some fifty years later (1683), 'A Letter from William Penn,' etc., in speaking "Of the fowl of the land," gives[2] "pigeons" as "in abundance." The same year, February 10, 1683, another letter from Pennsylvania by Thomas Paskel observes that[3] "There are here very great quantities of birds and one hardly thinks it worth while to shoot at ring pigeons...." 'A Collection of Various Pieces concerning Pennsylvania,' printed in 1684, finds[4] "The woods are supplied with a quantity of wild birds, as....pigeons,...."

[1] Mass. Hist. Soc. Coll., Fourth Series, IX, 1871, p. 130.
[2] Proud, Robert. The History of Pennsylvania, etc., Vol. I, 1797, p. 250.
[3] Penn. Mag. of Hist. and Biog., Vol. VI, p. 326.
[4] *Ibid.*, p. 313.

Two years later (September 13, 1686, Green Spring), 'A Letter from Doctor Moore Relating to the State and Improvement of the Province of Pennsylvania' yields this note of interest:[1] "We have had so great abundance of *Pigeons* this Summer, that we have fed all our Servants with them." About this same time, Pastorius found[2] "pigions" in "great abundance" in Pennsylvania. Several years later (1702), Holm, in speaking of birds and fowls in New Sweden, notes[3] both "turtle-doves" and "pigeons."

In verse we have two notes the first by Thomas Makin in 1729:[4]

> "Here, in the fall, large flocks of pigeons fly,
> So numerous, that they darken all the sky."

The other is undated and comes from John Holme.[5]

> "The pidgeons in such numbers we see fly
> That like a cloud they do make dark the sky;
> And in such multitudes are sometimes found,
> As that they cover both trees and ground:
> He that advances near with one good shot
> May kill enough to fill both spit and pot."

In 1741 Oldmixon merely mentions[6] pigeons as among the fowl of Pennsylvania. In 1765 we reach our first extended statement when Samuel Smith says:[7] "The wild pigeons, at three or four seasons in the year, commonly pay a visit (except in seed time) generally acceptable: They have not been observed of late years so plenty as formerly; they then, sometimes, to avoid the north-east storms, flew night and day, and thick enough to darken the air, and break trees where they settled, and were more tame and more wanted; all which made them an article of consequence to the early inhabitants: The Indians, before the European settlements, used every year regularly to burn the woods, the better to kill deer; . . . . this practice kept the woods clean, so that the pigeons readily got acorns, which then not being devoured by hogs, were

[1] Penn. Mag. of Hist. and Biog., Vol. IV, p. 449.
[2] Memoirs Hist. Soc. Penn., Vol. IV, 1840, 91. (Part II.)
[3] Mem. Hist. Soc. Penn., Vol. III, p. 41. (Part I.)
[4] Proud, Robert. The Hist. of Pennsylvania, etc., Vol. II, 1798, p. 367.
[5] Bull. Hist. Soc. Penn., Vol. I, 1845–47, p. 165.
[6] Oldmixon, John. *Vide supra*, Vol. I, p. 306.
[7] Smith, Samuel. The History of the Colony of Nova-Caesaria or New Jersey. Burlington, N. J., 1765. 2nd edit., 1877, p. 511.

plenty almost everywhere, and induced a return more frequently than now: They breed chiefly to the northward."

Of this species in Pennsylvania, William Bartram, in 1791, writes as follows:[1] "These arrive in Pennsylvania in the autumn, from the North, where they continue during the winter, and return again the spring following, I suppose to breed and rear their young; and these kinds continue their journies as far South as Carolina and Florida. In 1807 (July 31) at Presque Isle, Schultz records[2] the "pigeon." In 1819, C. B. Johnson reports that[3] "Wild pigeons commonly visit this place in the spring and autumn; when their numbers are truly astonishing. Flocks of them are sometimes seen, so large as to contain millions; their flesh is dark, and, when fat, very good." Lastly, at Allentown, Pa., about Sept. 10, 1832, Maximilian, Prince of Wied, says,[4] "the wild pigeons passed by in large flocks.

Virginia and Maryland.

In Virginia and Maryland we naturally would expect several early records of the pigeon, for many of the earlier scribes gave most of their attention to the colonies about the Potomac.

The first record by William Strachey (1610?–1612?) is interesting partly from its quaintness:[5] "A kind of wood-pidgeon we see in the winter time, and of them such nombers, as I should drawe from our homelings here (such who have seene, peradventure, scarce one more then in the markett) the creditt of my relation concerning all the other in question, if I should expresse what extended flocks, and how manie thousands in one flock, I have seene in one daie, wondering (I must confesse) at their flight, when, like so many thickned cloudes, they (having fed to the norward in the daye tyme) retourne againe more sowardly towards

[1] Bartram, William. Travels through North and South Carolina, Georgia, East and West Florida, etc. Philadelphia, 1791, Part II, p. 289.

[2] Schultz, Christian. Travels, etc., 2 vols., N. Y., 1810, Vol. I, p. 47.

[3] Johnson, C. B. Letters from the British Settlements in Pennsylvania. Philadelphia and London, 1819, p. 55.

[4] Early Western Travels, Vol. XXIII, p. 127.

[5] Strachey, Wm. Historie of Travale into Virginia. Hakluyt Soc., London, 1849, p. 126.

night to their roust; but there be manie hundred witnesses, who maie convince this my report, if herein it testifieth an untruth."

In 1612, Capt. John Smith writes:[1] "In winter there are plenty of Swans,....Pigeons." 'A Relation of Maryland,' 1635 practically repeats[2] the same observation. The next year (after Smith), 1613, Whittaker at Henrico writes to the same effect:[3] "In winter our fields be full of Cranes,....Pigeons,...." Two years afterwards Ralph Hamor found[4] "*wilde Pigeons* (in winter beyond number or imagination, my selfe have seene three or foure houres together flockes in the aire, so thicke that even they have shaddowed the skie from us)...." In 1624, Thomas Hariot, in his Historical Narrative, mentions[5] "Stockdoves," among the birds of the region. In 1650 Edward Williams (2nd edit. London, 1650) speaks very encouragingly of Virginia as follows:[6] "That no part of this happy Country may be ungratefull to the Industrious, The ayre it selfe is often clouded with flights of Pigeons...." Some twenty years later, Lederer found in his "several marches from Virginia to the West of Carolina," etc.[7], "great variety of excellent Fowl, as .... Pigeons...."

Soon after we discover a note where we would least expect it. This writer, with Dudley of Massachusetts, conceives of the flights of pigeons as portents. In 'The Beginning, Progress, and Conclusion of Bacons Rebellion in Virginia, in the years 1675 and 1676," he writes:[8] "About the year 1675, appear'd three prodigies in that country, which from th' attending disasters, were look'd upon as ominous presages. The one was a large comet.... Another was, fflights of pigeons in breadth nigh a quarter of the midhemisphere, and of their length was no visible end; whose weights brake down

[1] Smith, Capt. John, etc., Works of, 1608–1631. Edited by Edward Arber, 1884, p. 60.

[2] Narratives of Early Maryland. New York, 1910, p. 80.

[3] Hakluytus Posthumus or Purchas His Pilgrimes. By Samuel Purchas. Glasgow, 1905–1907. Extra Series Hakluyt Soc., Vol. XIX, 1906, p. 155.

[4] Hamor, Ralph. A True Discourse of the Present Estate of Virginia, etc., till the 18 of June 1614, etc. London, 1615. Richmond 1860, p. 21.

[5] Sir Walter Ralegh and his Colony in America. Prince Soc. Pub., Vol. XV, 1884, p. 218.

[6] Force, Peter. Tracts and Other Papers, etc. Vol. III, 1844, p. 12.

[7] Lederer, John. The Discoveries of, etc. By Sir William Talbot. London, 1672, p. 25.

[8] Force, Peter. *Ibid.*, Vol. I, p. 7.

the limbs of large trees whereon these rested at nights, of which the ffowlers shot abundance and eat 'em; this sight put the old planters under the more portentous apprehensions, because the like was seen (as they said) in the year 1640 when th' Indians committed the last massacre, but not after, untill that present year 1675."

Much later, Philip Bruce, in 'Social Life of Virginia in the Seventeenth Century' (Richmond, 1907, pp. 167, 213), writes as follows: "The clouds of wild pigeons arriving at certain seasons in incredible numbers, were killed by the tens of thousands, and for many weeks furnished an additional dish for the planter's table.... The destruction of the turkey and partridge did not approach that of the wild pigeon, a bird which arrived in Virginia at the same season annually in the course of its migration. All contemporary observers declare that the number of these birds appearing at these times was far beyond the power of human calculation; that for hours they darkened the sky like a pall of thunder clouds; and that they broke down, by their weight, the limbs of the forest wherever an entire flock lighted in search of food. It can be well imagined that the return of this vast multitude of birds was eagerly anticipated each year by every Virginian who was fond of the sport of shooting and capturing them. So thickly did they crowd the woods in different places, and so tame had they become from fatigue and hunger, that they were struck down in great numbers with poles reaching up to their perches; nor was the work of destruction confined to the day; thousands were killed in the same manner at night, when the glare of torches served to confuse and bewilder their eye-sight."

In 1722, Robert Beverly does not notice[1] the pigeon beyond a mere mention on two places. Six years later we come to William Byrd whose 'History of the Dividing Line Betwixt Virginia and North Carolina, 1728' (Petersburg, Va., 1841, p. 57) teems with natural history notes of real merit. Of a flight of pigeons, October 19, 1728, he speaks thus: "The men's mouths watered at the sight of a prodiguous flight of wild pigeons, which flew high over our heads to the southward. The flocks of these birds of passage are

[1] History of Virginia. London, 2nd edit., 1722, pp. 135, 275.

so amazingly great, sometimes, that they darken the sky; nor is it uncommon for them to light in such numbers in the larger limbs of mulberry trees and oaks as to break them down. In their travels they make vast havoc amongst the acorns and berries of all sorts, that they waste whole forests in a short time, and leave a famine behind them for most other creatures; and under some trees where they light, it is no strange thing to find the ground covered three inches thick with their dung. These wild pigeons commonly breed in the uninhabited parts of Canada, and as the cold approaches assemble their armies and bend their course southerly, shifting their quarters, like many of the winged kind, according to the season. But the most remarkable thing in their flight, as we are told, is that they never have been observed to return to the northern countries the same way they came from thence, but take quite another route, I suppose for their better subsistence. In these long flights they are very lean, and their flesh is far from being white or tender, though good enough upon the march, when hunger is the sauce, and makes it go down better than truffles and morels would do."

In 1739 (March 21), John Clayton of Gloucester Co., Va., in a letter writing of 'Virginia Game and Field Sports,' enumerates the best fowls, including[1] "wild Pidgeons in prodiguous great flocks, ..." Two years later Oldmixon says[2] "There's great Variety of wild Fowl, as . . . . Pigeons; "In 1763, Col. James Gordon of Lancaster Co., Va., made these entries in his journal:[3] "Jan. 18, 1763. Vast quantities of wild pigeons about; our people killed 60 or 70 of them. Jan. 20 Went out with . . . .who killed many wild pigeons." In 'A Topographical Description of the County of Prince George in Virginia,' 1793, John Jones Spooner states:[4] "The woods afford . . . .pigeons, ..." Thomas Jefferson in his 'Notes on the State of Virginia,' 1825 (written in 1781) gives (p. 99) the Pigeon as a Virginian bird noting only its common and scientific names. In Maryland, Ducatel, in speaking of South Mountain, valley of Middletown), says that[5] "at certain seasons

[1] Virginia Magazine, Vol. VII, Oct. 1899, No. 2, p. 173.
[2] Oldmixon, *vide supra*, Vol. I, p. 445.
[3] Williams and Mary Quarterly Hist. Mag., Vol. XII, July 1903, No. 1, p. 1.
[4] Mass. Hist. Soc. Coll., Vol. III, 1794 (reprint, 1810), p. 86.
[5] Trans. Maryland Acad. of Sci. and Lit., Vol. I, Baltimore, 1837, p. 40.

of the year the trees are literally covered with flocks of wild pigeons (*Columba migratoria*)."

In 1842, J. S. Buckingham writes at considerable length about this bird. He quoted Wilson's, Catesby's and Hinton's accounts, the first two of which are well known biologic sources and are therefore omitted. The last we retain because not so widely quoted. At Virginia Springs, August, Buckingham found[1] "The wood-pigeon was also more numerous than we had before observed it; and we were told, that sometimes their numbers here exceeded all belief."

"Hinton's account of these birds is as striking and as accurate as either of the preceding. 'The most remarkable characteristic of these birds is their associating together, both in their migrations, and during the period of incubation, in such prodigious numbers, as almost to surpass belief, and certainly to have no parallel among any other of the feathered tribes on the face of the earth, with which naturalists are acquainted. Their roosting-places are always in the woods, and sometimes occupy a large extent of forest. When they have frequented one of these places for some time, the ground is covered several inches deep with their dung; all the tender grass and underwood destroyed; the surface is covered with large limbs of trees, broken down by the weight of the birds clustering one above another; and the trees themselves, for thousands of acres, killed as completely as if girdled with an axe. The marks of this desolation remain for many years on the spot; and numerous places can be pointed out, where, for several years afterwards, scarcely a single vegetable made its appearance. When these roosts are first discovered, the inhabitants from considerable distances visit them in the night with guns, clubs, long poles, pots of sulphur, and various of other engines of destruction; and in a few hours they fill many sacks, and load their horses with the birds. The breeding-places are of greater extent than the roosts. In the western countries they are generally in beech-woods, and often extend, nearly in a straight line across the country, a great way. Not far from Shelbyville, in the state of Kentucky — once included within the boundary of Virginia — a few years ago, there

[1] Buckingham, J. S. The Slave States of America, 2 vols., London and Paris, 1842, Vol. II, pp. 330–332.

was one of these breeding-places, which was several miles in breadth, and upwards of forty miles in length. In this tract, almost every tree was furnished with nests, wherever the branches could accomodate them. The pigeons made their first appearance there about the 10th of April, and left it altogether, with their young, before the 25th of May. As soon as the young were fully grown, and before they left the nests, numerous parties of the inhabitants, from all parts of the adjacent country, came with waggons, axes, beds, cooking utensils, many of them accompanied by the greater part of their families, and encamped for several days at this immense nursery.'"

The Carolinas.

In the Carolinas we have a few brief notes and two extended accounts, the latter by Lawson and Wm. Bartram, who were certainly two of the best of the earlier observers.

In 1682 occur two notes by Ashe and Wilson. The first gives[1] the "Pigeons" as among the "Birds for Food, and pleasure of Game," while the second says,[1] "Here are also in the woods, great plenty of . . . .Turtle Doves, ...Piggeons."

In 1714, John Lawson's famous 'History of Carolina' appeared. First, in his 'Journal of a thousand Miles of Travel among the Indians from South to North Carolina,' when near Sapona, he encountered a flight of pigeons about which he remarks as follows:[2] "In the mean time, we went to shoot pigeons which were so numerous in these parts that you might see many millions in a flock; they sometimes split off the limbs of stout oaks and other trees upon which they roost of nights. You may find several Indian towns of not above seventeen houses, that have more than one hundred gallons of pigeon's oil or fat; they using it with pulse or bread as we do butter, and making the ground as white as a sheet with their dung. The Indians take a light and go among them in the night and bring away some thousands, killing them with long poles, as they roost in the trees. At this time of the year,

[1] Historical Collections of South Carolina. By B. R. Carroll. New York, 1836, Vol. II, pp. 73, 28.

[2] Lawson, John. The History of Carolina, etc. London, 1714. Reprinted Raleigh, 1860, pp. 78–79, 222, 231–233.

the flocks as they pass by, in great measure, obstruct the light of the day." He gives it also in his list of birds.

Closely following the above list comes a very interesting discussion of this form. "Our wild pigeons are like the wood queese or stock doves, only have a longer tail. They leave us in the summer. This sort of pigeon (as I said before) is the most like our stock doves or wood pigeons that we have in England; only these differ in their tails which are very long, much like a parrakeeto's. You must understand that these birds do not breed amongst us, (who are settled at and near the mouths of the rivers, as I have intimated to you before) but come down (especially in hard winters) amongst the inhabitants in great flocks, as they were seen to do in the year 1707, which was the hardest winter that ever was known since Carolina has been seated by the Christians.... Although the flocks are, in such extremities, very numerous; yet they are not to be mentioned in comparison with the great and infinite numbers of these fowl that are met withal about a hundred or a hundred and fifty miles to the westward of the places where we at present live; and where pigeons come down in quest of a small sort of acorns, which in those parts are plentifully found. They are the same we call turkey acorns, because the wild turkies feed very much thereon; and for the same reason those trees that bear them are called turkey oaks. I saw such prodigious flocks of these pigeons in January and February, 1701–2, (which were in the hilly country between the great nation of the Esaw Indians and the pleasant stream of Sapona, which is the west branch of Clarendon or the Cape Fair river) that they had broke down the limbs of a great many large trees all over those woods whereon they chanced to sit and roost, especially the great pines, which are a more brittle wood than our sorts of oak are. These pigeons, about sunrise, when we were preparing to march on our journey, would fly by us in such vast flocks that they would be near a quarter of an hour before they were all passed by; and as soon as that flock was gone another would come, and so successfully one after another for the great part of the morning. It is observable that wherever these fowl come in such numbers, as I saw them then, they clear all before them, scarce leaving one acorn upon the ground, which would, doubtless, be a great prejudice to the planters that should

seat there, because their swine would be thereby deprived of their mast. When I saw such flocks of the pigeons I now speak of, none of our company had any other of shot than that which is cast in moulds, and was so very large that we could not put above ten or a dozen of them into our largest pices; wherefore we made but an indifferent hand of shooting them; although we commonly killed a pigeon for every shot. They were very fat and as good pigeons as ever I eat. I enquired of the Indians that dwelled in those parts, where it was that those pigeons bred, and they pointed toward the vast ridge of mountains and said they bred there. Now, whether they make their nests in the holes in the rocks of those mountains or build in trees, I could not learn; but they seem to me to be a wood pigeon that build in trees, because of their frequent sitting thereon, and their roosting on trees always at night, under which their dung commonly lies half a foot thick, and kills everything that grows where it falls."

In 1761 and 1770 we have the following notes: the first, in 'A Description of South Carolina,' etc., gives[1] "the sorts of wild fowl that frequent the inland parts of the Country," as " .... Pidgeons, ...;" the second, "A Short Description of the Province of South Carolina: Written in the year 1763 by G. Milligen. London, 1770," states that[1] "In the woods and fields are plenty of wild turkeys ...., doves, pigeons, ..." Shortly after, Alex. Hewatt, in 'An Historical Account of .... South Carolina and Georgia' (London, 1779, Vol. I, p. 85), records "wild turkeys, pigeons, ..., and turtle doves, in great numbers ...."

Near the close of the eighteenth century William Bartram visited this region and in his 'Travels through North and South Carolina, Georgia, East and West Florida,' (Philadelphia, 1791, Part IV, Chap. X, pp. 469, 470), gives the following account: "Left Savannah in the evening, in consequence of a pressing invitation from the honourable Jonathan Bryan, Esq. who was returning from the capital, to his villa, about eight miles up Savanna river; .... At night, soon after our arrival, several of his servants came home with horse loads of wild pigeons (Columba migratoria) which it seems they had collected in a short space of time at a

[1] Hist. Coll. S. C. By B. R. Carroll. N. Y., 1836, Vol. 2, pp. 250, 482.

neighboring Bay swamp; they take them by torch light; they have particular roosting places, where they associate in incredible multitudes at evening, on low trees and bushes, in hommocks or higher knolls in the interior parts of vast swamps. Many people go out together on this kind of sport, when dark; some take with them little fascines of fat Pine splinters for torches; others sacks or bags; and other furnish themselves with poles or staves; thus accoutered and prepared, they approach their roosts, the sudden blaze of light confounds, blinds and affrights the birds, whereby multitudes drop off the limbs to the ground, and others are beaten off with their staves, which by the sudden consternation, are entirely helpless, and easily taken and put into the sacks. It is chiefly the sweet small acorns of the Quercus phillos, Quercus aquatica, Quercus sempervirens, Quercus flammula, and others, which induced these birds to migrate in the autumn to those Southern regions; where they spend their days agreeably, and feast luxuriously, during the rigour of the colds in the North, whither they return at the approach of summer to breed."

At the close of the century John Davis, in a 'Journey from Charleston to Coosahatchie,' remarks:[1] "Sometimes we fired in vollies at the flocks of doves that frequent the corn fields;...." Finally, in 1809, David Ramsay gives[2] "the pigeon" as one of the "birds of passage," in South Carolina.

The Gulf States.

In this region the pigeon record begins early. In Florida, as early as 1567, Rene Laudonniere and his associates "fortified and inhabited there two Summers and one whole Winter." Of this period they say:[3] "In the meane while there came unto our fort a flocke of stocke-doves in so great number, and that for the space

[1] Davis, John. Travels of Four Years and a Half in the United States of America during 1798, 1799, 1800, 1801, and 1802. London, 1803. New York edition, 1909, by A. J. Morrison, p. 91.

[2] Ramsay, David. The History of South Carolina, etc. Charleston, 1809, Vol. II, p. 333, 334.

[3] Hakluyt, Richard. The Principal Navigations Voyages Traffiques and Discoveries of the English Nation. Glasgow edit., 1903–1905. Hakluyt Society, Extra Series, Vol. IX, p. 53.

of seven weeks together, that every day wee killed with harquebush shot two hundred in the woods about our fort." In a description of Florida, 1587, this same captain enumerates[1] "Pigions, Ringdoves, Turtles, ..." At the close of the sixteenth century Daniel Coxe, in discussing the resources of the country, writes:[2] "I had almost forgotten to communicate two commodities, one for the health, the other for the defence of our bodies . . . . The latter is salt petre, which may probably be here procured cheap and plentifully, there being at certain seasons of the year most prodigious flights of pigeons, I have been assured by some who have seen them, above a league long, and half as broad. These come, many flocks successively, much the same course, roost upon trees in such number that they often break the boughs and leave prodigious heaps of dung behind them; from which, with good management and very little expense, great quantities of the best saltpetre may be extracted." In "Virginia richly valued, By the description of the mainland of Florida, her next neighbor", etc. (London, 1609),[3] "Pigeons" find a place. About a century and a half later, 1753, a writer notes that[4] "Along the coast of New Billoxi, one finds turtle doves. There is also in this country all kinds of birds of passage: there are in winter . . . .wood pigeon . . . ." Five years later, in 1758, 'The History of Louisiana,' by M. LePage Du Pratz, appeared in which the author recounts some of his experiences with this species.[5] "The Wood-Pigeons are seen in such prodigious numbers, that I do not fear to exaggerate, when I affirm that they sometimes cloud the sun. One day on the banks of the Mississippi I met with a flock of them so large, that before they all passed, I had leisure to fire with the small piece four times at them. But the rapidity of their flight was so great, that though I do not fire ill, with my four shots I brought down but two. These birds come to Louisiana only in the winter, and remain in

[1] Hakluyt Society, Extra Series, Vol. VIII, p. 451.

[2] Coxe, Daniel. A Description of the English Province of Carolana, By the Spaniards called Florida, and by the French La Louisane, etc., In Hist. Coll. Louisiana, By B. F. French. Part II, Philadelphia, 1850, p. 270.

[3] Force, Peter. *Ibid.*, Vol. IV, 1846, p. 132.

[4] Memoires Historiques sur la Louisiane. Paris, Tome Premier, 1753, p. 91.

[5] Du Pratz, M. Le Page. The History of Louisiana. London edit., 1774, pp. 278–280, 283, 196.

Canada during the summer, where they devour the corn, as they eat acorns in Louisiana. The Canadians have used every art to hinder them from doing so much mischief, but without success. But if the inhabitants of those colonies were to go a fowling for those birds in the manner that I have done, they would insensibly destroy them. When they walk among the high forest trees, they ought to remark under what trees the largest quantity of dung is to be seen. Those trees being once discovered, the hunters ought to go out when it begins to grow dark, and carry with them a quantity of brimstone which they must set fire to in so many earthen plates placed at regular distances under the trees. In a very short time they will hear a shower of wood-pigeons falling to the ground, which, by the light of some dried canes, they may gather into sacks, as soon as the brimstone is extinguished. I shall hear give an instance that proves not only the prodigious number of those birds, but also their singular instinct. In one of my journeys at land, when I happened to be upon the bank of the river, I heard a confused noise which seemed to come along the river from considerable distance below us. As the sound continued uniformly I embarked, as fast as I could, on board the pettyaugre, with four other men, and steered down the river, keeping in the middle, that I might go to any side that best suited me. But how great was my surprise when I approached the place from whence the noise came, and observed it to proceed from a thick short pillar on the bank of the river. When I drew still nearer to it, I perceived that it was formed by a legion of wood-pigeons, who kept continually up and down successively among the branches of an ever-green oak, in order to beat down the acorns with their wings. Every now and then some alighted to eat the acorns which they themselves or the others had beat down; for they all acted in common, and eat in common; no avarice nor private interest appearing among them, but each labouring as much for the rest as for himself." "The pigeons for their fine flavour and delicacy are preferred by Europeans to those of any other country."

Of the same region T. Jeffreys writes in 1760;[1] "The number of

[1] Jeffreys, T. The Natural and Civil History of the French Dominions in North and South America. 1760, Part I, p. 160.

wood-pigeons which swarm here in winter, and in *Canada*, where they remain till autumn is astonishing; in *Louisiana* they feed upon acorns, in *Canada* they do much mischief by devouring the grain. They may be taken by finding out their recesses, and fumigating them with brimstone in the night. By this means they fall from the branches in heaps, and torches should also be provided to frighten them, and afford light at the same time for collecting them."

In Georgia, in 1776, they observed that[1] "when it is very cold weather in the northern parts of America, here are vast flights of wild pigeons, which are very easy to shoot." In upper Louisiana Stoddard (1812) finds that the[2] "forests . . . ., according to the best accounts, contain about a hundred and thirty species of birds. The most useful of them are several kinds of ducks . . . . the pigeon, ..." In Texas, Kennedy, writing in 1841, says[3] "the sportsman, ...will also find on land good store of . . . .pigeons . . . .suited to the table."

Central States East of the Mississippi River.

In this wide region many interesting records occur of which the following are doubtless only a small portion. Daniel Coxe, in speaking of the country about Lake Erie, enumerates the[4] "pigeons" among his "wild animals of this country." In 1698 Hennepin, when on the River Ouisconsin, found that[5] "Six Charges of Powder was all that we had left, which oblig'd us to husband it as well as we could; wherefore we divided it into twenty to shoot only for the future at Turtles or Wild Pigeons."

In 1769, Bossu says:[6] "When one approaches the country of the Illinois, one sees, during the day, clouds of doves, a kind of

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[1] The History of North America. London, 1776, p. 225.

[2] Stoddard, Major Amos. Sketches Historical and Descriptive of Louisiana. Phila., 1812, p. 231.

[3] Kennedy, Wm. Texas: etc. 2nd edit., London, 1841, Vol. I, p. 130.

[4] Coxe, Daniel. *Vide supra*, p. 261.

[5] Hennepin, L. A New Discovery of a Vast Country in America, etc. London, 1698, p. 193.

[6] Bossu, M. Nouveaux Voyages aux Indes Occidentales. Premiere Partie, Amsterdam, 1769, pp. 96, 97.

wood or wild pigeons. One thing which may perhaps appear incredible, is that the sun is obscured by them; these birds living on nothing but beechnuts and acorns of the forests, are excellent in autumn; one sometimes kills as many as 80 of them at one shot." In 1772, 1773, Rev. David Jones, records in the Ohio valley [1] "not many pigeons." In Ohio the Rev. M. Cutler found pigeons as he had in Massachusetts (p. 98). When not far from Marietta on September 10 and 11, 1788, he entered in his journal the following: [2] "Saw some pigeons, but killed none." "Went on shore after pigeons alone,.... Killed one pigeon,...." In his trip to Miami, in 1785, General Butler on December 8, at Hebron, notes [3] "pigeons very plenty flying over." In 1792 John Heckewelder made a journey to the Wabash and on his trip along the Ohio observed that [4] "Sunday, December 2d the flight of wild pigeons was indescribable, the low-lands were entirely covered with them. The inhabitants, with few exceptions forgot it was Sunday and went out to shoot pigeons."

In 1805 (September 2), when near Cassville, Wisc., Pike [5] "landed to shoot pigeons." April 16, 1806, at Brownsville, he also mentions that he "Shot at some pigeons at our camp." Several years elapse before Hulme's 'Tour in the Western Countries of America, Sept. 30, 1818–Aug. 8, 1819.' appeared. On June 23, 1819, we have this entry: [6] "See....thousands of pigeons. Came to Pigeon Creek, about 230 miles below the Falls, and stopped for the night at Evansville." At French Lick, July 5, 1819, he records: "Some of the trees near the Judge's [his host] exhibit a curious spectacle; a large piece of wood appears totally dead, all the leaves brown and the branches broken, from being roosted upon lately by an enormous multitude of pigeons. A novel sight for us unaccustomed to the abundance of the backwoods!" There

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[1] Jones, Horatio G. Journal of Rev. David Jones. In Cincinnati Miscellany. By Chas. Cist. Vol. II, p. 232.

[2] Cutler, W. P. and Julia P. Life, Journals and Correspondence of Rev. Manasseh Cutler. Cincinnati, 1888, Vol. I, pp. 98, 422.

[3] The Olden Time, Vol. II, 1847, p. 495.

[4] Penn. Mag. Hist. and Biog., Vol. XII, 1888, p. 182.

[5] Pike, Zebulon Montgomery, The Expeditions of, During the Years 1805–6–7. New edit. by Elliott Coues. 3 vols. N. Y., 1895. Vol. I, pp. 32, 206.

[6] Early Western Travels, 1748–1846. Edited by R. G. Thwaites. Cleveland, O., 1904, Vol. X, pp. 45, 63.

appeared, this same year, the Edinburgh edition of Warden's three volume account of the United States. In it, he records [1] the pigeon as numerous in the Ohio valley, New Hampshire, New York, New Jersey, Pennsylvania, Tennessee, South Carolina, Louisiana, Mississippi, Michigan, Missouri, and Florida.

In 1819 Faux (Memorable Days in America, etc. London, 1823) also encountered the pigeon at Zainsville, Ohio, and in Tennessee. At the former place, October 14, he [2] "Wandered in the fields shooting pigeons, which is here fine sport; they fly and alight around you on every tree, in immense flocks, and loving to be shot. They are rather smaller than English pigeons, and have a lilac breast; but in other respects are blue, or blue grey. They breed in the woods, and seem to court death by the gun, the sound of which appears to call them together, instead of scaring them away; a fowling-piece well charged with dust shot might bring down a bushel of these willing game at your feet." In the latter instance he describes in detail a pigeon roost, which "is a singular sight in thinly settled states, particularly in Tennessee in the fall of the year, when the roost extends over either a portion of woodland or barrens, from four to six miles in circumference. The screaming noise they make when thus roosting is heard at a distance of six miles; and when the beech-nuts are ripe, they fly 200 miles to dinner, in immense flocks, hiding the sun and darkening the air like a thick passing cloud. They thus travel 400 miles daily. They roost on the high forest trees, which they cover in the same manner as bees in swarms cover a bush, being piled one on the other, from the lowest to the topmost boughs, which so laden, are seen continually bending and falling with their crushing weight, and presenting a scene of confusion and destruction, too strange to describe, and too dangerous to be approached by either man or beast. While the living birds are gone to their distant dinner, it is common for man and animals to gather up or devour the dead, then found in cartloads. When the roost is among the saplings, on which the pigeons alight without breaking them down, only

[1] Warden, D. B. A Statistical, Political, and Historical Account of the United States of North America, etc. Edinburgh, 3 vols., 1819. Vol. I, pp. 382, 496; Vol. II, pp. 38, 351, 411, 528; Vol. III, pp. 10, 55, 76, 139, 140, 223.

[2] Early Western Travels, Vol. XI, pp. 174, 175, 236, 237.

bending them to the ground, the self-slaughter is not so great; and at night, men, with lanterns and poles, approach and beat them to death without much personal danger. But the grand mode of taking them is by setting fire to the high dead grass, leaves, and shrubs underneath, in a wide blazing circle, fired at different parts, at the same time, so as soon to meet. Then down rush the pigeons in immense numbers, and indescribable confusion, to be roasted alive, and gathered up dead next day from heaps two feet deep." In Michigan, 1819, Dana found that[1] "pigeons .... in autumn appear in swarms, and prey upon corn and new sown wheat."

On September 27, 1820, James Flint in his 'Letters from America,' etc. (Edinburgh, 1822), finds that on the east side of the little Miami River[2] "The woods abound in pigeons, a small species of fowls which migrates to the southward in winter, and return to the north in spring. Their numbers are so immense that they sometimes move in clouds, upwards of a mile in length. At the time when they are passing, the people have good sport in shooting them, as one flock frequently succeeds another before the gun can be reloaded. The parts of the woods where they roost, are distinguished by the trees having their branches broken off, and many of them deadened by the pressure of the myriads that alight upon them."

In 'Travels from Detroit Northwest', etc., Schoolcraft when at Sandy Lake July 13, 1820 says:[3] "The .... pigeon and turtle dove, occasionally appeared in the forest, to enliven this part of the journey." At Prairie du Chien, "The pigeon, ... are also common along this part of the Mississippi." In a much later work this same author uses the pigeon to illustrate the hurry and bustle of a busy town.[4] "Whoever has seen a flock of hungry pigeons, in the spring, alight on the leaf-covered ground, beneath a forest, and

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[1] Dana, E. Geographical Sketches on the Western Country, etc. Cincinnati, 1819, p. 262.

[2] Early Western Travels, Vol. IX, p. 301.

[3] Schoolcraft, H. R. Narrative Journal of Travels from Detroit Northwest, etc., in the year 1820. Albany, 1821, pp. 216, 356.

[4] Schoolcraft, H. R. Personal Memoirs of a Residence of Thirty Years with the Indian Tribes on the American Frontiers, etc., 1812–1842. Phila., 1851, pp. 95, 367.

apply the busy powers of claw and beak to obtain a share of the hidden acorns that may be scratched up from beneath...."

In 1822, John Woods (Two Years Residence.... in the Illinois Country, etc., London, 1822) writes that[1] "The birds [of the country] are...., pigeons, doves,..... Pigeons are sometimes in immense flocks, smaller than the wild pigeons, but larger than the tame ones of England. A great number of doves, much like turtle doves." "In my two journeys I saw a great number of wild-ducks and pigeons on the banks of the Wabash; although a bad shot, I think if I had had a gun, I could have killed a great many." His third and last note is September 1, 1820: "We have had large flocks of pigeons, from the north, almost continually passing over us for the last week."

On the Fox River, just before September 1, 1827, Thomas L. M'Kenney found[2] "pigeons.... numerous." In the same year W. Bullock (Sketch of a Journey through the Western States of America, etc., London), when at Cincinnati, Ohio, says,[3] "the farmyard abounds with *wild* pigeons, as tame as our domestic ones." The following year (1828) Timothy Flint records in Indiana that[4] "in some seasons, wild pigeons are seen here in countless numbers. Where they roost, the limbs of the trees are broken off in all directions by their numbers."

Of the period 1830–1840 one pioneer in Michigan says:[5] "Of the pigeons [they came] by the million," and recalls "their digging acorns out of the deep snow." In 1835 there appeared 'Sketches and Eccentricities of Colonel David Crockett' in which a long description of a pigeon roost appeared (pp. 193, 194.) "The habits of the wild pigeon have long been a subject of much curiosity. The great numbers in which they appear, and the singular propensity that they have to roost together, have for some time been a source of speculation. They frequently fly as much as eighty miles to feed, and return to their roost the same evening.

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[1] Early Western Travels, Vol. X, pp. 291, 315, 345.

[2] M'Kenney, Thomas L. Memoirs, Official and Personal, etc. 2 vols., New York, 1846. Vol. I, p. 104.

[3] Early Western Travels, Vol. XIX, p. 140.

[4] Flint, Timothy. A Condensed Geography and History of the Western States on the Mississippi Valley. Cincinnati, 1828. Vol. II, p. 163.

[5] Michigan Pioneer and Hist. Colls., Vol. XIV, p. 512.

This was proved by shooting them at their roost of a morning when their craws were empty, and then shooting them again in the evening when they returned. Their craws were then found filled with rice, and it was computed that the nearest rice-field could not be within a less distance than eighty miles. I have often seen pigeons roosts in the older states, but they scarcely give an idea of one in the west. I have seen a cloud of those birds cover the horizon in every direction, and consume an hour in passing. And near a roost, from an hour before sunset until nine or ten o'clock at night, there is one continued roar, resembling that of a distant waterfall. A roost frequently comprises one hundred acres of land; and strange, though literally true, as can be attested by thousands, the timber, even though it be of the largest growth, is so split and broken by the immense numbers which roost upon it, as to be rendered entirely useless. There are few persons hardy enough to venture in a roost at night. The constant breaking of the trees renders it extremely dangerous; and besides there is no necessity for shooting the birds, as the mere breaking of the limbs kills many more than are taken away. A pigeon roost in the west resembles very much a section of country over which has passed a violent hurricane. Wolves, foxes, *etc.*, are constant attendants upon a pigeon roost."

In Ohio, Caleb Atwater says:[1] "The wild pigeon comes in the spring, sometimes in March, or even earlier, on his journey north, and after paying us a visit, of about a month, passes on his journey. In September he returns to see us again, spending six weeks with us, feasting on the pigeon berry, phytolacca decandra, the new acorns, and other nuts, and such food as the country produces for his use. Formerly the pigeons tarried here all summer, building their nests, and rearing their young; but the country is too well settled for them now; so, like the trapper for beaver, and the hunter, they are off into the distant forests, where their food is abundant, and where there is none to disturb them in their lawful pursuits."

Upon Lake Michigan Jas. H. Lanman records:[2] "During

[1] Atwater, Caleb. A History of the State of Ohio. 2nd edit., Cincinnati, 1838, pp. 93, 94.

[2] Lanman, Jas. H. History of Michigan, etc., New York, 1839, p. 278.

certain periods, violent thunder storms rage....; and the shore has been known to be covered with the skeletons of pigeons and gulls, which had been drowned in crossing at such times. Eagles, in great numbers, also frequent these shores, in order to glut themselves upon their dead bodies, which are thrown upon the beach."

In Indiana, at New Harmony, Maximilian, Prince of Wied, finds [1] "pigeons,....were seen in the orchards during the whole winter." In the same State at a somewhat later date (1849), the 'Indiana Gazetteer,' (3rd edit., Indianapolis, p. 15) records: "A place called the Pigeon Roost, in Scott county, was formerly so much resorted to by Pigeons, that for miles nearly all the small branches of a thick forest were broken off by their alighting in such numbers on them, and the ground was covered with their ordure several inches in depth for years afterwards. In the south-east corner of Marion county there was a similar Pigeon Roost, and several others in the State have been mentioned."

Finally, Ferris's note of Michigan says: [2] "The wild pigeons, in countless numbers, will hover, and flutter, and flap among the bur-oaks."

West of the Mississippi Valley.

In this wide expanse of territory the pigeon is not so common as eastward of the Mississippi. The roll of records is not extended. It begins with the Lewis and Clark Expedition. When near 47° 3′ 10″ north latitude July 12, 1805, Patrick Gass says,[3] "Here we saw some wild pigeons and turtle doves." A day later (July 13, 1805), at White Bear Islands (Missouri River), Lewis says: [4] "I saw a number of turtledoves and some pigeons today, of the latter I shot one; they are the same common to the United States, or the wild pigeon as they are called." Near the same place one

[1] Early Western Travels, Vol. XXII, p. 195.

[2] Ferris, J. The States and Territories of the Great West. N. Y. and Auburn, 1856, p. 176.

[3] Gass, Patrick. Journal of the Voyages....of Capt. Lewis and Capt. Clarke, etc. 4th edit., Phila., 1812, p. 107.

[4] Lewis and Clark Expedition, 1804–1806, Original Journals of. Edited by R. G. Thwaites. 8 vols., New York, 1904–5. Vol. II, p. 227.

year later, July 12, 1806 he again[1] "saw . . . ., pigeons, doves; etc. the yellow Currants beginning to ripen." On Aug. 26, 1805 Clark near Shoshone[2] saw "Some fiew Pigions," as did he on July 21, 1806 (Missouri River), July 5, 1806, and Feb. 12, 1804 (near St. Louis, Mo.).[3]

In 1811, Brackenridge made a voyage up the Missouri River, and May 7, when near the mouth of the Platte,[4] "killed some pigeons." In 1817, Maj. Stephen H. Long went in a "six-oared skiff to the Falls of Saint Anthony." In the course of his journey, near Lake Pepin, July 18, he[5] "killed a few pigeons."

In 'A View of the Lead Mines of Missouri' (New York, 1819), Schoolcraft says (p. 37), "pigeons, ... in some parts of the interior, are so numerous that the woods seem alive with them." In an 'Account of an Expedition from Pittsburgh to the Rocky Mountains, performed in the Years 1819 and '20,' etc., under . . . . Maj. Stephen H. Long,"[6] "*Columba migratoria* — Passenger pigeon (*C. Canadensis* is the female. Temm.)" occurs in the list of birds; at Engineer Cantonment (Council Bluffs), "*Columba migratoria* arrived May 2, 1820"; and lastly, August 28, "Several small flocks of the common wild-pigeons flew by us both yesterday and today, in a southerly direction." The same commander, in his expedition to the St. Peter's River, etc., in 1823, when on the above river says:[7] "The party that travelled in the boats, saw abundance of pigeons, but with the exception of these, no other kind of game; . . . . The land party, although provided with an excellent hunter, killed but a few pigeons; . . . ."

In 1820, Stephen W. Kearny, in 'A Narrative Account of the Council Bluffs, St. Peter's Military Expedition,' etc., says that July 22, 1820, they[8] "followed up, on the margin of the river,

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[1] Lewis and Clark Expedition, Thwaites ed., Vol. V, p. 200.
[2] *Ibid.*, Vol. III, p. 44.
[3] *Ibid.*, Vol. V, p. 279; Vol. VI, pp. 169, 221.
[4] Brackenridge, H. M. Views of Louisiana, etc. Pittsburgh, 1814, p. 225.
[5] Coll. Hist. Soc. Minnesota, Vol. II, p. 44.
[6] James, Edwin. Account of An Expedition . . . . under . . . . Maj. Stephen H. Long, etc. 2 vols., Phila., 1823. Vol. I, p. 373, 377; Vol. II, p. 231.
[7] Keating, William H. Narrative of An Expedition to the Source of St. Peter's River, Lake Winnepeek, Lake of the Woods, etc. Performed in the Year 1823, etc. under . . . . Maj. Stephen H. Long, 2 vols. Phila., 1824, p. 292.
[8] Kearny, Stephen Watts, The 1820 Journal of, edited by V. M. Porter, pp. 23, 42. Reprinted from Missouri Hist. Soc. Coll., Vol. III, 1908.

seeing.... great many Pigeons, several of which we shot...." On August 5, at "Bear Creek," they "Started at 4 A. M. passed 'Bear Creek' on the *West* and at breakfast time stopped at a small Island, where we saw a large flock of pigeons, and secured 8 of them for our dinner." The year following, 1821, Schoolcraft, observed[1] "the beautiful passenger pigeon." In Missouri, 1828, Flint says:[2] "Turtle doves are always numerous, as in some seasons are the wild pigeons." In 1832 he observes that[2] "Pigeons sometimes are seen in great flocks. Their social and gregarious habits incline them to roost together, and their places of resort are called 'pigeon roosts.' In these places they settle on all the trees for a considerable distance round, in such numbers, as to break off the branches." The same year Schoolcraft, in a 'Narrative of an Expedition through the Upper Mississippi to Itasca Lake,' etc., in 1832 (New York, 1834, pp. 54, 106), "saw.... the common pigeon, which extends its migrations over the continent."

The next year (July, 1833), at Big Muddy River, Maximilian, Prince of Wied, in his 'Travels in the Interior of North America,' says:[3] "Messrs. Bedmer and Mitchell made an excursion into the wood, where they saw many wild pigeons,...." At old Fort Clarke they found the wild pigeon, also along Cannonball River, N. D. In 1834, John K. Townsend made 'A Journey across the Rocky Mountains to the Columbia River,' and says,[4] "when beyond St. Charles, Mo., March 31, in the morning, we observed large flocks of wild pigeons passing over...." At Powder Creek, August 28, he says, "Game has been exceedingly scarce, with the exception of a few grouse, pigeons, ..."

One year later, in November, 1855, Dr. Williamson, when among the Dahkotahs, wrote to the 'Cincinnati Journal' that[5] "Exclusive of their corn, their feed consists.... in the summer, [of] roots, fish, wild pigeons, and cranes." In 1837, Alphonso Wetmore,

[1] Schoolcraft, H. R. Travels in the Central Portions of the Mississippi Valley. New York, 1825, p. 72.

[2] Flint, T. A Condensed Geography and History of the Western States, etc. Cincinnati, 1828, Vol. II, p. 73; also The History and Geography of the Mississippi Valley, Cincinnati, 1832, Vol. I, pp. 72, 200.

[3] Early Western Travels, Vol. XXIII, pp. 32, 250; XXIV, p. 86.

[4] Early Western Travels, Vol. XXI, pp. 126, 269.

[5] Neill, Edward Duffield. The History of Minnesota, etc., Philadelphia, 1858, p. 445.

states:[1] "The game of Missouri, the ranks of which are thinned as settlements advance, consists of .... wild pigeons...."

In 1848, James Hall, who has written so much of the West says:[2] "I have never seen any of those *pigeonroosts*, which have excited so much curiosity, and where these birds are said to alight in such quantities as to break down the limbs of the trees." Lastly, in 1851, J. W. Bond, in 'Camp Fire Sketches' writes:[3] "Today [August 24, 1851], our French-Canadians and half breeds, who had charge of the provision and baggage-carts, have been shooting pigeons...."

A COMPARATIVE STUDY AT COBB'S ISLAND, VA.

BY ALFRED B. HOWELL.

ON June 22, 1909, I arrived at Cobb's Island, Virginia, equipped for a week's stay, having made the trip solely for the purpose of ascertaining the conditions then prevailing among the water birds breeding there, in order to compare them with the facts gathered by Mr. T. Gilbert Pearson in 1892 (Oologist, Vol. IX, No. 8) and Mr. Frank M. Chapman in 1902 (Camps and Cruises of an Ornithologist) in the same locality. I chose this island in preference to others because it was the most accessible of any of the large breeding grounds, and because it is uniformly well known.

There is frequently a change from year to year in the prevalent conditions among a colony of birds, until at the end of a decade, it has often become very pronounced. Sometimes these changes can be ascribed to known causes, and again the reasons are veiled in mystery even to the most observant.

In the good old days Royal and Least Terns bred upon the

[1] Wetmore, Alphonso. Gazetteer of the State of Missouri. St. Louis, 1837, p. 29.

[2] Hall, James. The West: Its Soil, Surface, and Productions. Cincinnati, 1848, p. 124.

[3] Bond, J. W. Minnesota and its Resources, New York, 1853, p. 257.

island by the thousands, but they have been driven away and neither of them has bred in the locality for years. Willet also were extremely abundant at one time, but this cannot be said of them at present. Following is a list of breeding water birds found upon the island at the three different periods referred to. Mr. Pearson in his paper, failed to give the approximate numbers of birds observed of some of the species, and therefore I am compelled to estimate from the general trend of the article.

	Mr. Pearson 1892	Mr. Chapman 1902	A. B. Howell 1909
Laughing Gull, *Larus atricilla*	common	several hundred	2000
Gull-billed Tern, *Gelochelidon nilotica*	mere mention	16	16
Forster's Tern, *Sterna forsteri*	considerable number	small number	0
Common Tern, *Sterna hirundo*	considerable number	several hundred	300
Black Skimmer, *Rynchops nigra*	large number	thousands	300
Willet, *Catoptrophorus semipalmatus*	10	2	4
Wilson's Plover, *Ochthodromus wilsonius*	not uncommon	2	0
Oyster-catcher, *Hæmatopus ostralegus*	several pairs	2	0

The stories which I heard concerning the wholesale slaughter of *Sterna antillarum* in past years are almost beyond belief. For ten cents apiece, men shot these birds until their shoulders had become too raw to fire a gun: shot them by the hundreds and the thousands as long as there were enough left to pay for a morning stroll. Small wonder that they have been wiped out entirely in this locality. The scarcity of the Willet, Oyster-catchers and Wilson's Plovers can be ascribed to the depredations of visiting sportsmen. I searched in the marshes for Forster's Terns, but in vain, for although I caught a glimpse of what may have been one of these birds, I cannot be sure. The Gull-billed Terns seem to be holding their own, as do the Common Terns, which latter are apt to be found nesting anywhere along high water marks, but seem to prefer the colonies of Skimmers.

The most interesting problem was the reason for the rate of increase and decrease in the numbers respectively of the Laughing Gulls and Black Skimmers. The latter were nesting in four rather small colonies several miles from the Life-saving Station, and as they nest later than, and their eggs are smaller than those of the Gulls, the fishermen confine their attention almost exclusively to the nests of the latter. More than this, the people of this section have a more kindly feeling towards the Skimmers than the Gulls, and the plumage of the former has always been of even less value commercially than that of the latter. The nests of the Laughing Gulls are robbed by the fishermen twice, so I am told, and at the third setting of eggs, are left in peace, but one would think that even with this slight encouragement, they would leave the island for more favorable localities. However, they are thriving and growing fat and increasing from year to year, while the sea dogs, as the Skimmers are called locally, seem destined to take the trail back to the Southland. Nor can their growing scarcity be due to high tides flooding their nests, for these as a rule are higher above the water than are those of the Gulls. The only explanation that seems to be left is one which Mr. E. J. Court of Washington, assures me is now accepted by the majority of ornithologists who are conversant with the conditions of that section. It is that the schools of a certain small fish on which the Skimmers feed almost exclusively, have within the past few years forsaken the locality, and that now there are only enough left for the few birds remaining. Another reason that some have advanced is that during a series of heavy winter storms several years ago, the southern end of the island was washed away. However, as fully nine tenths of the original island is left, this supposition seems to be hardly worth mentioning.

Clapper Rails (*Rallus crepitans*) are found upon the island in the greatest abundance, and evidently have always been just as numerous. At this time, most of their eggs were pipped, and a few sets had already hatched. A habit which the Rails had was that of very often placing their nests within about three feet of those of the Gulls. I am sure that this was from no feeling of friendship, for the Gulls love to tease the Rails, and I have seen them swoop at the latter on their nests, while the victims danced

up and down in great fury at not being able to reach their tormentors. In one nest of *crepitans* containing eggs of the rightful owner there were two eggs of the Laughing Gull, but these had been pushed to one side. These birds' nests were very easy to find on account of the tall marsh grass being bent over them toward the center, dome-fashion.

I took an umbrella blind with me in order to facilitate my photographing, and also to study the nesting birds at close range. It is no light work to start out for a walk of six miles through the soft sand laden down with a heavy camera, several dozen plates, large umbrella tent and other paraphernalia, not forgetting the water bottle, when the thermometer is registering one hundred and two. However, this was refreshing compared to the dreadful heat which I experienced with the sun pouring down upon my blind after I had crawled into it and closed every cranny except two small holes. Complete quiet had settled down among the birds in less than an hour.

Mr. Chapman was the first to disprove the popular falacy that the Skimmers incubated only during the night and in cloudy weather, and I also observed that they incubate throughout the brightest days, although they are very restless, remaining on the nest for but a few minutes at a time. One would alight on the sand, waddle up to the nest and after inspecting its contents, settle down upon the eggs. Then almost invariably she would cock her eye at the sun, and finding that orb fully up to her expectations, she would give over her thoughts to serious business for a while. This species is to me at least, one of the most interesting of the sea birds. They have a certain ease of flight that is not surpassed even by the Terns, and to see one quartering the little tide creeks at dusk is enough to stir the interest of the most blasé ornithologist. They often fly in straggling flocks of about a dozen individuals, and when passing, strongly remind one of a pack of hounds on the trail, as Mr. Chapman so aptly puts it, for their cry is an almost exact counterpart of the yelp of a hound.

In the middle of the day when one decides to feed, he often chooses a place where a wave has broken and is receding down the beach. Then he flies along where the water is about two inches deep, skimming with his lower mandible beneath the surface. At

such times, he hits bottom every twenty feet or so, and his head is jerked back in a most comical manner.

The Gull-billed Terns were the only birds which continued to be suspicious of my blind, and the Common Terns accepted it as a necessary evil within a half hour.

During my stay I spent in all about eleven hours in my blind within sight of many Gulls, but they seem to be less rapacious than some of their cousins, for I saw them attempt to steal eggs only once. In this locality and at this time of year the Gulls feed almost exclusively on soft-shelled crabs, which they capture with great dexterity.

Other species of birds observed on the island were:

Green Heron (*Butorides virescens*), one.

Osprey (*Pandion haliaëtus carolinensis*), one.

Phœbe (*Sayornis phœbe*), one pair breeding.

Red-winged Blackbird (*Agelaius phœniceus*), several, probably breeding.

Meadowlark (*Sturnella magna*), one pair.

Seaside Sparrow (*Passerherbulus maritimus*), abundant, chiefly at the northern end of the island.

Song Sparrow (*Melospiza melodia*), common.

Barn Swallow (*Hirundo erythrogastra*), four pairs breeding.

BIRD PROTECTION IN FOREIGN LANDS.

BY G. EIFRIG.

IN MAY, 1910, the "First German Convention for Bird Protection" was held at Charlottenburg, near Berlin, Germany. This representative gathering had assembled at the invitation of four of the largest and most important societies devoted to the study and protection of birds in that country. What impresses one most forcibly when reading of such societies and their deliberations in Germany and England, is the high standard of excellence in the speeches held and lectures delivered, and, what should

probably be mentioned first, the great number of influential people, men and women, who take an *active* interest in these things over there, such as members of government, both national and state, university professors, principals and teachers of high and public schools, foresters, etc. The logical thoroughness and system, for which Germany is well known, also show themselves here, and in consequence the resolutions adopted at such meetings usually find a prompt acceptance on the part of the national or state governments, which make them effective by issuing the necessary orders.

One of the many excellent addresses delivered at the above named convention struck the writer as being particularly interesting and instructive and deserving of being more widely made known. It is entitled "Der Vogelschutz im Auslande," (Bird Protection in Foreign Countries), and was delivered by Staff veterinarian, Dr. Heuss of Paderborn. He takes up the countries in which efforts tending toward bird protection are made in alphabetical order, and we, though by no means making a literal translation of his statements, do the same, with the exception of substituting for his remarks on the United States, which we do not need for our purposes, such on Germany, which naturally are omitted by the speaker over there.

BELGIUM. Although this is one of the backward countries as regards bird protection, even here such a movement is making headway. The first hopeful sign is the founding of the "Societé belge contre le port des Plumes" under the energetic leadership of Madame van Hoorde of Brussels. The government also seems to be alive to its duties under the Paris convention, which it had joined. It has forbidden the shooting of gulls, and an order of the agricultural department has put more birds on the protected list, including the Wood Pigeon (*Columba palumbus*). The forestry branch is combating the caterpillar pest by putting up drinking places for birds in dry parts of the country, to thus attract birds to them once more. Otherwise the Belgians are among the worst sinners against birds. Great numbers of finches, larks, even nightingales are caught in nets and otherwise, plucked and put up for sale in cities.

DENMARK. Here the very active propaganda for bird protec-

tion is continued under the leadership of the "Soalen" society, of which Mrs. (Col.) Malvine Mehrn is president. In a circular to all the bishops of the country, entitled "Church and protection of animals," the attention of the reverend gentlemen is drawn to the ethical aspect of the protection of animals in general and that of birds in particular. Many illustrated lectures are held before schools and societies, and the audiences at such are always large and appreciative. In a memorandum sent to the board of directors of the royal railways, it was proposed that the railway embankments should be planted with trees and berry-bearing shrubs, to furnish the birds with nesting sites and winter food.

ENGLAND, with her colonies, affords a very gratifying example of systematic and earnest endeavors in bird protection, successfully directed and carried out. The bill which Lord Avebury introduced into Parliament, designed to combat the evils arising out of the sale of birds' skins and feathers, found a ready response in many circles, and Mr. James Buckland of the Royal Colonial Institute, and the Royal Society for the Protection of Birds are leaving no stone unturned to bring the matter to a successful finish. In the meantime Lord Crewe, Minister of State for the Colonies, has called together a commission of experts of the Colonial Office and of the National Museum of Natural History to devise ways and means how the wholesale destruction of birds in the interest of fashion may best be stopped in the different parts of the empire. The above named society also merits praise for issuing, under the English title 'How to Attract and Protect Wild Birds', the well known book by Hiesemann, the appropriate foreword of which having been written by the skilful pen of the Duchess of Bedford. At the same time a sales agency for the food and nesting appliances designed by Baron von Berlepsch has been opened. A noticeable resolution was adopted by the British Ornithologists' Union, at a special general meeting, namely this, that a member who is found guilty of having killed or having aided and abetted the killing of certain birds, is to be suspended from membership.

[In CANADA the status of bird protection is, generally speaking, satisfactory. Most provinces have bird laws upon their statute books which are nearly or entirely like the Audubon model law.

Spring shooting of ducks and shorebirds is prohibited in most Provinces, which is more than can be said of some States in the Union. Restrictions on the shipping of game are in force, where it is not entirely forbidden, as well as hunters' licenses. From personal interviews the writer knows that Sir Wilfred Laurier is heartily in accord with the idea of bird protection, he is in fact a great lover of nature and close observer of birds. Not so much can be said of the present Minister of the Interior, but even he was willing to set aside islands in the lakes of the great northwest as bird reservations. If the A. O. U. or the National Audubon Society would send one or two well posted people to Ottawa, when the political waves do not run as high as now, no doubt something could be done to help in establishing bird refuges on what is practically worthless land, to have parts of the shore of the oceans put under the surveillance of the light house tenders and life savers, etc. Meanwhile birds are fully protected at all times in the extensive national and provincial parks and forest reservations.]

In FRANCE, unfortunately, conditions are not so favorable, they, in fact, being more like those of Belgium and Italy. While the cause of ornithology and bird protection has recruited a powerful protagonist in the "Revue française d'Ornithologie scientifique et pratique," published monthly by Henri Tressier in Orléans and ably edited by M. Louis Denise, librarian of the National Library, and Dr. A. Menegaux, assistant curator at the National Museum in Paris, strong complaints continue to be voiced regarding the wholesale killing of small insectivorous and song birds in southern France. M. Perier, a deputy from that part of the country, has calculated that in his election district alone no less than 700,000 birds had been caught and killed in five months!

[In GERMANY the idea of bird protection is probably most thoroughly and systematically carried out. The birds always had a better chance there — except in the districts where netting was formerly carried on, a practice which has now been stopped by an act of the Reichstag — because the gun "toting" habit, so prevalent here, was always unknown, especially on the part of boys. But now, since the Reichstag passed the famous law just alluded to, followed by the legislatures of the different states,

a veritable flood of measures, designed to protect birds and increase their numbers, are being enacted by cities, villages, park boards, land owners, etc., to aid in this movement. The nesting boxes and feeding apparatus for birds, designed by von Berlepsch, are installed wholesale in many places, and the other ways and means tried out and perfected by him on his model bird station are introduced. Vagabond cats are caught and destroyed. Waste land is planted with shrubbery, the ministries of the several state railways direct that this be done also along the railway embankments; farmers, laborers, school children, students are led to take an active part in the work, until it has become a national movement. The summer resorts at the sea coasts have tended to drive away sea birds; this is overcome by establishing reservations along the coast, much as in this country, with gratifying results. The best known of these are along the coast of the North Sea: Jordsand, Ellenbogen, Norderoog and Memmert, and Langenwerder in the Baltic Sea. State boards of forests and private forest owners also help in this work, and the result is a surprisingly large bird population, which was forcibly brought home to the writer, when on a trip to Europe in 1908.]

ITALY [still is the *bete noire* of European bird protection. After having long ago nearly depleted the country of resident birds, the Italians now lay in wait for the hordes of migrant birds from central and northern Europe and net and kill them by the thousands. The strings of even the smallest dead song and insect-eating birds for sale in the Italian cities are well known to all travelers there and are objects of repugnance to them.] But more and more influences are setting themselves to work against this slaughter of the innocents and the cruelties perpetrated in connection with it. Anticruelty and bird protective societies, as well as individuals, are competing to bring the agriculturists to a sense of the harm they are doing themselves and the country at large by their wanton destruction and to show them the benefits conferred upon them by birds. This is done by leaflets, pamphlets, and newspaper articles. Especially praiseworthy in this respect is the literary activity displayed by Dr. Casoli, physician at Cevoli near Pisa, and by L. Riccabone of Turin in his journal 'Il mondo animale,' the 'Animal World.' Another step in the

right direction is the prohibition of using live pigeons in shooting contests, which has hitherto been a prominent source of popular enjoyment.

[In AUSTRIA-HUNGARY, strange to say, the preponderance in respect to bird protection is with the second partner in the dual monarchy. We, in America, generally speaking, usually have no very high opinion of Hungary and things Hungarian, but as regards this movement, we must take off our hats to them. Hungary is nearly, if not quite, at the top of the ladder in bird protection. What is being introduced and tried out in this respect in other countries for the last five years, has been known and established in Hungary for many years past.] This is owing to the energetic and devoted and practical leadership the movement has found here early, in the person of the venerable Otto Herman, who with youthful energy, is still keeping it at the height of perfection. Owing to the initiation of the Royal Hungarian "Zentrale" for bird protection, the International Agricultural Congress at Rome in 1909 passed several noteworthy resolutions aiming at the better protection of birds in the various countries represented. Surely, a gratifying achievement.

In Austria itself, the other part of the dual monarchy, the council of Vienna, the capital, leads in putting ordinances on the statute books, which aim at protecting and attracting birds. Permits to trap birds for cage purposes are no longer issued in Vienna. Lower Austria has also recently passed a bird law, in which all birds are divided into three kinds, useful, harmful and indifferent. The first may not be caught or killed throughout the year; the harmful ones may be taken at any time, subject, however, to the limitations placed on this by the game and fish police; for the indifferent ones a close season lasting from February 1 to September 15 is established.

In NORWAY it is especially the Christiania society for the protection of animals, under the excellent leadership of the royal equerry Sverdrup, that is doing telling work. In a circular addressed to all the town and village councils in the country, these were made acquainted with the leading principles of bird protection. The monthly journal of the society, 'Dyrenesven,' in each number contains essays and news concerning bird protection.

In SWEDEN a similar activity is shown by the "Ladies' Society for the Protection of Animals," whose president is the Countess Anna Runth. This society is lately organizing the young people of the country for its purposes and this will, no doubt, lead to better protection for birds.

SWITZERLAND. The little model republic, naturally takes no back seat also in this matter. It is fully abreast with other countries. Here too the women are just now doing good work for the cause. Thus the 'Ligue féminine romande contre la destruction des oiseaux pour la parure' has lately issued a brochure entitled 'Le massacre des oiseaux et les crimes de la mode,' in which the pernicious results of the wholesale slaughter of birds to satisfy the whims of fashion are pointed out. This agitation is also carried into the daily papers and into the schools.

[For the UNITED STATES, the great work carried on by the Audubon Society, under the excellent and self-sacrificing leadership of Mr. W. Dutcher, is highly commended.]

VENEZUELA, even, has fallen in line and has determined upon a generous and, as is to be hoped, efficient policy to avert the threatened extinction of the beautiful egrets which are to be found there. On the 18th of April, 1910, a special law was passed, in which all killing of the egret is forbidden. This has sent a cold shudder down the spines of the Parisian feather dealers, who thereupon got a bogus "naturaliste-explorateur" to write a pamphlet in which he bravely lied that when the plumes of the egrets were taken not a single bird was killed, etc. [How much this falsehood is one "of whole cloth," was recently shown in 'The Auk' and in 'Bird-Lore.']

And finally BRAZIL has taken its place among the enlightened nations. On the 15th of January, 1909, a law was passed which protects all birds that are beneficial to agriculture and also prohibits the killing of rheas, gulls, terns, storks and herons, as also the taking of eggs and destroying of nests and the taking away of the nestlings. It is made incumbent upon the municipal councils to make this decree known as widely as possible and to enforce its provisions.

N. B. The matter in brackets has been added by the translator.

CONCEALING-COLORATION: A DEMAND FOR INVESTIGATION OF MY TESTS OF THE EFFACIVE POWER OF PATTERNS.

BY ABBOTT H. THAYER.

IN 1896 naturalists received from me ('The Auk,' April, 1896) the first analysis of the effacing-power of counter-shading, and in the same article the discovery of the concealing-power of patterns (then accredited by me, through misinformation, to H. W. Bates as a previous discoverer). Soon after, I secured acceptance for the counter-shading part by proving that it was possible so to counter-shade an object as to make it invisible. *The same inevitable recognition awaits the similar effacing-power of pattern, whenever naturalists will come and study my proofs.* I, to whom they already acknowledge their debt for the discovery of counter-shading, demand to be trusted that it is I alone who am in a position to judge whether they need to study these proofs.

It begins to seem necessary to try once more to convince those naturalists who oppose me that they are acting on a misunderstanding, reiterating statements that I have never contradicted, and refusing either to notice what I do state, or to study optics itself, which is purely and simply the thing I am communicating to them.

Up to the present moment there is not a naturalist in the world who has seen any representative number of my tests of animals' costumes' background-reproduction, or who has any adequate conception what they really are. A few naturalists have seen a very few of them; and in the main those who have seen the most are the most convinced, while those who have seen none are the ones who are most loudly ridiculing the whole thing. It is among these latter that there exists an idea that the remarkable disappearance of each brilliant costume against a *certain* background merely proves my ingenuity.

When, for instance, I take a bird and spend an hour in finding a type of vegetation, situation and view-point in which he is absolutely indistinguishable, this operation is open to two inter-

pretations. To the superficial and unreceptive observer it represents merely my ingenuity. To the eye of science it is the ascertaining whether the background against which the bird can disappear is typically such a one as that against which he would commonly be looked at by his enemy or prey.[1] Invariably, it is the establishment by this means of the fact that his costume is a case of concealing-coloration. For it is evident that to match any one type of background,— sky, vegetation, or earth,— is all that any costume could do. When all these costumes prove to match the very backgrounds we think they most need to, the grounds for imputing to them other reasons for their present extremely complicated and exact development seem to lag superfluous.

For instance, the vast class of black-and-gold species, so long called conspicuous (birds, insects and reptiles), are essentially confined to regions of vegetation,— that is, where sunlight and shadow convert the whole scene itself into black and gold. Black and gold is more than nine tenths of the aspect of the deepest parts of such forest foliage as the sun can penetrate. This fact, apparently so unfamiliar to naturalists, is proved by the former fact, that amidst such a scene the black-and-gold species so closely match as to be apt to pass unnoticed if they keep still; — and a similar correspondence holds clear through the entire animal kingdom.

Many naturalists have an absurd idea that I am telling them they cannot see these species where they are conspicuous. I am merely showing them that nature could do no more than she has done to hide these species, condemned as they are by aërial habits to many moments of contrasting background, which inevitably reveal their motion. Further, that the home of the black-and-gold class is where the typical background is black and gold; — and that this principle applies to all classes the world over. An unthinking person must go on talking about the many creatures that he *sees*, and never reflect on the evidence that he *misses* many

[1] It is even the *only* means of forcing the less imaginative observer to perceive that he would always fail to detect any motionless *live* animal that happened to be as favorably backgrounded, and hence to perceive that there *is a percentage of them that he does not discover.*

others. If any doubter would, for instance, place an artificial bird the size of a peacock up in the sunlit trees, and try to color it so that it would show less in the first twenty different situations he tried for it, than a real stuffed (or live) peacock proved to show, he would begin to learn something that he has never yet dreamed of.

Hummingbirds are a beautiful demonstration of the fact that even *almost constant conspicuousness* is no evidence that the costume of a species is not obliterative. On the contrary, it will soon be recognized that the very climaxes of obliterative coloration are to be found, just where one would expect, among the very species whose activities condemn them to the greatest conspicuousness. A feeding hummer's incessant motion makes him practically one of the most conspicuous of birds; and yet, behold, when you place a *still* one anywhere amidst the same flowers, you discover that he is as exquisitely effaced by background reproduction as any barkmoth or wood frog. The very same thing is true of the flamingo, the zebra, the peacock, and, of course, the world of species of which these happen to seem to us to be climaxes.

Now, as soon as the objecting naturalists understand that by *concealing-coloration* our book means coloration that works where it is most needed, and not necessarily elsewhere, and when their attention has been called to the fact that the more the butterfly or hummer matches the flower-masses where he has to risk his life the more he must show elsewhere, they will have begun to study. On the sea, when Dr. Townsend detected all the white-backed male eiders, and not the brown females, the flock was in dark water, probably between him and the cliff. At sea, there is almost all the time a dark direction and a light one, according to the sky,—silvery water to port and dark to starboard. In the one the white eiders vanish, in the other, if it be excessively dark, the brown ones are the dimmest, but, to equal the perfect vanishing of the males when they are in bright water, the females need to be seen in actual cliff-reflection. Once out beyond these reflections, the brown eiders on a calm sea are dark spots from almost every view-point, while the white parts of the males totally disappear whenever they are looked at toward the light. I too have seen eiders, both American and European, the latter by hundreds; but this was not necessary: any white birds on the sea will do, and the case of old and young gulls is just as good to study.

The oft-repeated objection that the wearers of these costumes perpetually reveal themselves by motion, and that consequently my tests give a wrong impression, is just what shows lack of taking in what my investigation is. My whole assertion is that the *costumes* of these creatures are not what reveal them, and the objector's repeated declaration that the real animal moves and shows himself simply backs me up. The use of motionless stuffed skins is the pure method of studying the effect of the patterns *apart* from that of motion.

In behalf of those who would like to trust our book, there are a few things that it is best to say about the recent attack on it by Dr. Thomas Barbour and Mr. J. C. Phillips. These men have committed toward us many offenses. They have tried to write down a book which they prove that they have never read with any thoroughness. One example must here suffice. They write that in their judgment a flamingo would look *dark* against a dawn or evening sky,— saying this with the evident aim of implying that we state the contrary. In our text twice, and *five times* in the legends over the pictures, we clearly go over this point. Seven times in all. Their article contains four or five other serious misrepresentations of our book, aside from several misstatements about my private history.

As to Mr. H. C. Tracy's studious and most courteous article on white top marks as directive in flight, it is as obvious to me as to him that whatever constant pattern a creature wears is sure to aid in its *recognition*, both at rest and in flight. Also, that *if* he were right that white patterns displayed in flight tend to make the wearer's *course* more conspicuous to its companions, these patterns might be assumed to owe their existence in corresponding degree to this use. The trouble is, however, that it seems plain that such is not the case. Flight implies being more or less higher than the ground. In the open, the *first* bird to take flight is seen by his companions against sky, *or at the angle where sky is to be expected*, and from this view his whites tend to efface him. Then, when many birds are on wing together in the open, they are on an average moving on a level, *i. e.*, on a tangent to the earth's surface,[1]

[1] More accurately, a tangent of a sphere *larger* than the world, and, of course, outside of it.

and their *average* background to each other's eyes is the bottom of the *sky*, not the earth. In the woods the case is still stronger, There even the best-illuminated white is so deeply (green-) shadowed as to average dark green-gray against the actual sky-glimpses above. Its being actually the lightest note in the place simply makes it show least, while *black* here shows most,— *i. e.*, in every upward direction; which means in half of all directions. In addition to all this, even the brightest white relieves *dark* against the brighter parts of the forest floor whenever it is itself in deeper foliage-shadow than this background. (For a fuller analysis of all this see my 'Arraignment' article [1] in the 'Popular Science Monthly' for Dec., 1909.) In other words, white in the woods is the least conspicuous of colors, and black the most so, in as many as three-quarters of all directions. Add to this that in patterns it always helps to 'cut up' the wearer; and remember also the wonderful function shown in Figs. 1, 2, 3 and 4 of the above-named 'Popular Science' article. When a white-wing-patterned bird flashes out his flight-whites, all the concealing-faculties of brilliantly contrasted patterns shown in those illustrations spring into play, *and trebly so because of* motion, when every dark part is as it were chalked over into dimness by each flap of the white-patterned wings. The inevitability of *detection* through motion had made people suppose it was the *patterns* that caused the detection. What they *do* cause is *identification after* detection.

Monadnock, New Hampshire,
September 1, 1911.

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[1] I shall be delighted to send reprints of this article to all applicants.

NOTES FROM EASTERN ALBERTA.

BY WINTHROP S. BROOKS AND STANLEY COBB.

THE following observations were made between August 15, 1909, and February 1, 1910, within a five mile radius of the northern end of Birch Lake, Alberta (latitude 53° 20′ N., longitude 111° 40′ W.), about 90 miles east of Edmonton, the capital of the province. The altitude here is about 1,800 feet above sea level.

Birch Lake itself is a large body of water, some 20 square miles in area, sending northward a long shallow arm. The country immediately surrounding this northern arm consists of level prairie, the smooth expanse of grass occasionally interspersed with patches of bushes. About a mile and a half north of the lake the topography changes to low, rolling hills, with an increase of the bushy growth and scattered groups of small trees. This area is thickly dotted with shallow sloughs and small lakes of varying sizes; the whole forming an admirable resort for wild fowl and waders.

The waders, however, seemed to leave this region very early. On August 15 when Birch Lake was first visited many varieties of shore birds were seen by hundreds, but on returning on the 19th the numbers were much diminished; thereafter they kept leaving steadily, until by September 1 (when, by the way, the shooting season in Alberta opens on these birds) the great majority had left for the south. Yellowlegs and Pectoral Sandpipers were the only species that remained abundant through September.

The list is obviously limited, but as the observers went into the country purely on a shooting trip, birds other than wild fowl and waders were noted only during spare moments, or when they chanced to be in the writers' paths.

1. **Colymbus holbœlli.** HOLBŒLL'S GREBE.— A few seen Sept. 3.
2. **Colymbus auritus.** HORNED GREBE.— Several noted.
3. **Podilymbus podiceps.** PIED-BILLED GREBE.— Quite common.
4. **Gavia immer.** LOON.— One immature shot, Sept. 15.
5. **Larus delawarensis.** RING-BILLED GULL.— Fairly common on larger bodies of water.

6. **Larus philadelphia.** BONAPARTE'S GULL.— Abundant in a small lake 3 miles north of Birch Lake, whence they flew to the latter every night. Last seen Oct. 13.

7. **Hydrochelidon nigra surinamensis.** BLACK TERN.— Fairly common until the middle of September.

8. **Lophodytes cucullatus.** HOODED MERGANSER.— Several seen Aug. 15 and 19.

9. **Anas platyrhynchos.** MALLARD.— Breeds here. Abundant, staying until lakes were frozen over.

10. **Chaulelasmus streperus.** GADWALL.— Breeds. Fairly common until Sept. 11 when a great flight arrived. Left about Oct. 1.

11. **Mareca americana.** BALDPATE.— Abundant. Apparently breeds here. Last noted on Oct. 9.

12. **Nettion carolinense.** GREEN-WINGED TEAL.— Abundant in sloughs. Breeds. Last noted Oct. 6.

13. **Querquedula discors.** BLUE-WINGED TEAL.— Abundant; breeds. Last noted Oct. 6.

14. **Spatula clypeata.** SHOVELLER.— Abundant; breeds. Left the last of September.

15. **Dafila acuta.** PINTAIL.— Breeds. Common, but less so than the other Anatinæ. Last noted on Sept. 29.

16. **Marila americana.** REDHEAD.— Uncommon, seen only on larger bodies of water.

17. **Marila valisneria.** CANVAS-BACK.— Quite common; breeds.

18. **Marila affinis.** LESSER SCAUP DUCK.— Abundant; breeds. Remained until lakes were frozen over.

19. **Clangula islandica.** BARROW'S GOLDEN-EYE.— Common on larger bodies of water during last of September and first part of October. First seen Sept. 10 when 2 females were shot.

20. **Charitonetta albeola.** BUFFLE-HEAD.— Fairly common; breeds.

21. **Oidemia deglandi.** WHITE-WINGED SCOTER.— Fairly common; apparently breeds.

22. **Erismatura jamaicensis.** RUDDY DUCK.— A few seen.

23. **Chen hyperboreus hyperboreus.** SNOW GOOSE.— Three flocks of from 100 to 300 seen on Oct. 11 and 13.

24. **Branta canadensis canadensis.** CANADA GOOSE.— Quite common, breeds; very few flight birds seen.

25. **Botaurus lentiginosus.** BITTERN.— Common about sloughs.

26. **Ardea herodias herodias.** GREAT BLUE HERON.— One seen on Aug. 22.

27. **Grus americana.** WHOOPING CRANE. — Several flocks of large cranes were seen flying southward, high in the air, and uttering a mellow, rolling call; one of these flocks contained 57. On the night of Sept. 21 there was a heavy migration of these birds, their call being heard at all hours of the night. Positive identification was impossible, but as the birds were very large, and were migrating from the north, it seems reasonably certain that they were Whooping Cranes.

28. **Porzana carolina.** SORA.— Quite common about sloughs.

29. **Fulica americana.** COOT.— Flocks noted on Birch Lake on Aug. 19 and 23.

30. **Steganopus tricolor.** WILSON'S PHALAROPE.— Small flocks seen several times on Birch Lake.

31. **Recurvirostra americana.** AVOCET.— Six seen at Birch Lake Aug. 15.

32. **Gallinago delicata.** WILSON'S SNIPE.— Abundant. Tremendous flight on Aug. 24.

33. **Macrorhamphus griseus griseus.** DOWITCHER.— On Aug. 19 we fired into a flock of ten Dowitchers killing two of this variety, and one Long-billed Dowitcher.

34. **Macrorhamphus griseus scolopaceus.** LONG-BILLED DOWITCHER.— Beside the above record one was shot on Aug. 28.

35. **Micropalama himantopus.** STILT SANDPIPER.— Three seen on August 28 at Birch Lake, two of which were shot. Another was shot on Sept. 6. All were in company with Yellowlegs.

36. **Pisobia maculata.** PECTORAL SANDPIPER.— Common Aug. 28 to Oct. 5.

37. **Pisobia bairdi.** BAIRD'S SANDPIPER.— Common at Birch Lake.

38. **Pisobia minutilla.** LEAST SANDPIPER.— Common at Birch Lake.

39. **Ereunetes pusillus.** SEMIPALMATED SANDPIPER.— Uncommon.

40. **Calidris leucophæa.** SANDERLING.— One shot at Birch Lake, Sept. 6.

41. **Limosa fedoa.** MARBLED GODWIT.— Quite common around Birch Lake in flocks of 4 or 5. Left early in September.

42. **Totanus melanoleucus.** GREATER YELLOWLEGS.— Uncommon.

43. **Totanus flavipes.** YELLOWLEGS.— Very abundant about lakes and sloughs. Last seen on Oct. 5.

44. **Helodromas solitarius cinnamomeus.** WESTERN SOLITARY SANDPIPER.— Common.

45. **Catoptrophorus semipalmatus inornatus.** WESTERN WILLET. — Six seen in all; on Aug. 15 and 19, and Sept. 2.

46. **Bartramia longicauda.** UPLAND PLOVER.— Two seen on Aug. 15.

47. **Tryngites subruficollis.** BUFF-BREASTED SANDPIPER.— A few seen at Birch Lake during latter part of August. Two specimens taken.

48. **Actitis macularia.** SPOTTED SANDPIPER.— Several noted between August 15 and 30 at Birch Lake.

49. **Squatarola squatarola.** BLACK-BELLIED PLOVER.— Common on the Birch Lake flats.

50. **Charadrius dominicus dominicus.** GOLDEN PLOVER.— A few shot during latter part of August.

51. **Oxyechus vociferus.** KILLDEER.— Not an abundant bird, but a few could always be found.

52. **Ægialitis semipalmata.** SEMIPALMATED PLOVER.— Common at Birch Lake in August.

53. **Arenaria interpres morinella.** RUDDY TURNSTONE.— Twice noted at Birch Lake; one seen on Aug. 25; two seen, one shot, on Aug. 28.

54. **Bonasa umbellus umbelloides.** GRAY RUFFED GROUSE.— A few small flocks were seen in late autumn in the low growth about lakes.

55. **Pediœcetes phasianellus campestris.** PRAIRIE SHARP-TAILED GROUSE.— Abundant in small coveys until about Nov. 1, when those in the vicinity formed into two large flocks of from 75 to 100 each.

56. **Cathartes aura septentrionalis.** TURKEY VULTURE.— One seen flying over prairie Sept. 7.

57. **Circus hudsonius.** MARSH HAWK.— Very common. Twice found eating ducks we had shot.

58. **Buteo borealis calurus.** WESTERN RED-TAIL.— One seen Aug. 24.

59. **Buteo swainsoni.** SWAINSON'S HAWK.— This bird and the Marsh Hawk were the typical hawks of the region. Every landscape seemed to contain a Marsh Hawk flapping low over the prairie and a stolid Swainson's sitting on some fence post or hay stack.

60. **Aquila chrysaëtos.** GOLDEN EAGLE.— Two seen late in October.

61. **Falco columbarius columbarius.** PIGEON HAWK.— A few seen in September.

62. **Falco sparverius.** SPARROW HAWK.— Several seen on Aug. 19.

63. **Pandion haliaëtus carolinensis.** OSPREY.— One flying over Birch Lake on Sept. 17.

64. **Asio flammeus.** SHORT-EARED OWL.— Abundant. Could be found around nearly every slough at twilight.

65. **Bubo virginianus pallescens.** WESTERN HORNED OWL.— One seen Oct. 11. Two found poisoned by coyote baits on Nov. 17.

66. **Dryobates villosus leucomelas.** NORTHERN HAIRY WOODPECKER.— One seen Nov. 15.

67. **Colaptes auratus luteus.** NORTHERN FLICKER.— Two noted Sept. 15.

68. **Tyrannus tyrannus.** KINGBIRD.— Common.

69. **Corvus corax principalis.** NORTHERN RAVEN.— One seen every day during week of Nov. 15 to 22.

70. **Corvus brachyrhynchos brachyrhynchos.** CROW.— Abundant; often in tremendous flocks.

71. **Sturnella neglecta.** WESTERN MEADOWLARK.— A few noted.

72. **Icterus spurius.** ORCHARD ORIOLE.— One seen Aug. 19.

73. **Euphagus cyanocephalus.** BREWER'S BLACKBIRD.— Abundant; left about Sept. 20.

74. **Astragalinus tristis.** GOLDFINCH.— A few noted during latter part of August.

75. **Plectrophenax nivalis nivalis.** SNOW BUNTING.— Appeared the first week in November. Abundant.

76. **Calcarius lapponicus lapponicus.** LAPLAND LONGSPUR.— Abundant in large flocks during latter part of September.

77. **Pœcetes gramineus confinis.** Western Vesper Sparrow.— A few seen in August.

78. **Passerculus sandwichensis alaudinus.** Western Savannah Sparrow.— Common on prairie.

79. **Ammodramus savannarum bimaculatus.** Western Grasshopper Sparrow.— Quite common in long grass.

80. **Zonotrichia leucophrys leucophrys.** White-crowned Sparrow.— Several seen Sept. 5.

81. **Spizella monticola ochracea.** Western Tree Sparrow.— Common during first part of October.

82. **Progne subis subis.** Purple Martin.— Quite a number seen flying over Birch Lake on Aug. 25.

83. **Iridoprocne bicolor.** Tree Swallow.— A large number seen with the Purple Martins on Aug. 25.

84. **Bombycilla cedorum.** Cedar Waxwing.— Three observed Aug. 30.

85. **Lanius borealis.** Northern Shrike.— Two seen Oct. 5.

86. **Anthus spraguei.** Sprague's Pipit.— Abundant.

87. **Penthestes atricapillus septentrionalis.** Long-tailed Chickadee.— First seen Oct. 4; common for a few days after this.

88. **Planesticus migratorius propinquus.** Western Robin.— Two seen Aug. 30.

A NOTE ON THE NESTING OF THE WHIP-POOR-WILL.

BY A. DAWES DU BOIS.

The following notes were made in connection with two nests of the Whip-poor-will (*Antrostomus vociferus*) near the village of Bradford, in Sangamon County, Illinois. The first nest was found on May 16, 1908, in a strip of woods of medium size trees, thickly undergrown, on a high bank of the Sangamon River. The ground was well carpeted with dried oak leaves. Our first intimation of Whip-poor-wills in this place was the sudden appearance of an adult bird fluttering along the ground in front of us, apparently with a broken wing. We stopped at once and while my companion stood to mark the place, I followed the bird a short distance. She fluttered along noiselessly, feigning serious

injury and leading me away from the nest as rapidly as I could be induced to follow.

A search revealed the nest within a pace of the spot we had marked. It contained one egg and the broken shell of another which gave evidence of having hatched. Although I stooped to examine the broken shell I did not see the bird that had hatched from it until my companion called my attention to it. The little fellow was crouched, motionless, upon the brown leaves not six inches from the broken egg-shell. It was thickly clothed with extremely soft, fluffy down, of uniform yellowish brown which harmonized with the dead oak leaves all about it. A more complete protective coloration would be difficult to imagine. The tubular nostrils have, in the young bird, an exaggerated prominence, and this is perhaps its most striking characteristic.

Although the young nestling was absolutely motionless when discovered, it exhibited no fear upon being taken in hand, and even scrambled toward the source of sound when the writer held it near his face and made a faint clucking noise with his mouth.

There was no indication that the leaves had been arranged by the parent to form a nest; they were merely flattened down somewhat where the brooding bird had been sitting. The nest was situated among a few saplings, with an occasional may-apple growing about the spot, but there seemed to be no special attempt at secreting it. The unhatched egg had the appearance of being fresh but it proved to be infertile.

Having marked the spot we left the woods, curious to know whether or not the parents would remove their young to another place on account of our intrusion. We returned next day and found the parent bird brooding her little offspring not more than three feet from the original nest. She fluttered from the spot as she had done the previous day, but this time uttering a very low hissing or "soughing" sound. It was upon this second day that photographs of the young bird and of the parent were taken. The adult was afraid of the camera and did not return to her young for more than an hour after the camera had been placed. She kept vigilant watch, however, at a short distance, moving about near the ground with a remarkably noiseless flight but uttering a "chip" or "whit" similar to that of a domestic chick. She finally perched

on a dead branch a few feet from the young bird and sat there a long time watching the camera. Her calling to the young resulted in its moving several feet toward her, so that the camera had to be re-focused. This was done quietly and as quickly as possible without changing the position of the tripod, and then I left the vicinity entirely. Upon returning some time later to the end of the operating thread, I found the old bird in position for her photograph. It was impossible to distinguish her from her surroundings, at a distance of forty or fifty feet, without the aid of the field glass.

Only one parent was observed during these investigations. Later in the day three other Whip-poor-wills were flushed in the same woods but a search failed to reveal any evidence that they were nesting.

Again on June 15, a Whip-poor-will was flushed in another woods a few miles further south. She feigned injury in the same manner as previously described; I stopped immediately, and upon looking down found two eggs six feet from where I stood. They were deposited on the dead oak leaves as before and were not concealed by underbrush or otherwise. This nest, like the previous one, was on high ground and in dense woods.

I desired to test this bird to see if she would remove the eggs after they had been disturbed and it occurred to me to test the bird's discrimination, at the same time, by substituting a pair of Mourning Dove's eggs for her own. Having found a dove's nest earlier in the day, I secured the eggs and left them in place of the Whip-poor-will's. They were practically the same size,— somewhat smaller,— but the difference in coloration was quite pronounced — the dove's eggs being pure white and the Whip-poor-will's richly marked in their characteristic manner.

Upon returning next day, I stopped thirty feet from the spot at which the eggs had been left. Nothing but leaves could be seen with the unaided eye, and my first thought was that the eggs had been removed, but a look through the field-glass revealed the Whip-poor-will sitting contentedly on the Mourning Dove's eggs, exactly where I had left them the previous day.

ROOSEVELT'S 'REVEALING AND CONCEALING COLORATION IN BIRDS AND MAMMALS.'

BY J. A. ALLEN.

UNDER this title[1] Mr. Roosevelt presents a critical and extended review of the Messrs. G. H. and Abbott H. Thayer's book entitled 'Concealing-Coloration in the Animal Kingdom,' published early in 1910.[2] In this book, he says: "The doctrine of concealing coloration as an explanation of almost every kind of coloration in the animal kingdom has received its widest application....In its extreme form as stated by these gentlemen, the doctrine seems to me to be pushed to such a fantastic extreme and to include such wild absurdities as to call for the application of common sense thereto. The Messrs. Thayer state their position in the most positive form. Fundamentally it is that, in the first place, all or practically all animals are concealingly colored, and in the next place, that while their patterns in all cases help thus to conceal them the chief factor in their concealment is the countergradation of shades, their inconspicuousness being due, not to their color being like that of the surrounding objects, but to this countergradation causing them to escape being seen at all. In order to show the sweeping claims made by the Messrs. Thayer, and accepted by their followers, I quote their exact language:" (Here follows a page or more of quotations from their book.)

"Before discussing these positions and the argument advanced on behalf of them by the Messrs. Thayer," continues Mr. Roosevelt, "I wish to call attention to certain arguments of theirs, both in the shape of pictures and in the shape of letter-press, which are really not arguments at all, properly so considered, but are simply misstatements of facts, or wild guesses put forward as facts. I do not for a moment suppose that the misstatements are intentional on the part of the Messrs. Thayer. I believe that they are due to the enthusiasm of a certain type of artistic temperament, an enthusiasm

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[1] Revealing and Concealing Coloration in Birds and Mammals. By Theodore Roosevelt. Bull. Amer. Mus. Nat. Hist., Vol. XXX, pp. 119–131, August 23, 1911. Price, 60 cents. Address, Librarian, American Museum of Natural History.

[2] Noticed in this journal, Vol. XXVII, April, 1910, pp. 222–225.

also known to certain types of scientific and business temperaments, and which when it manifests itself in business is as sure to bring the owner into trouble as if he were guilty of deliberate misconduct." He then takes up these alleged misstatements and devotes some ten pages to them, criticising his pictures of the peacock, zebra, chickadee at nesting-hole, oyster-catcher, wood duck, flamingoes, spoonbills and ibises, and the accompanying text; also the "flank-markings" of ducks, the head, bill and leg markings in rapacious birds, and the effect of iridescence in birds.

As an example of the comment on these alleged misstatements we may cite (p. 131): "Again, Mr. Thayer says that the fact that the scarlet tanager's coloration 'divides it into two things, a black and a red thing,' shows that it is not 'meant to be conspicuous' because in that case it would be a 'monocrome.' But the summer red-bird and the cardinal are both monochrome! Mr. Thayer simply forgets this, and forgets that the argument he advances to show that one is inconspicuous, necessarily shows that the two others are conspicuous. As a matter of fact, of course the plumage of all three birds is highly advertising." In the way of general comment, in this connection, he says: "Mr. Thayer's book is for the most part filled with theories predicated upon observations made under conditions which are designedly abnormal. Any practical expert with colors knows that extraordinary effects can be wrought by a proper arrangement of lights and shadows. If seen against the horizon under certain conditions of light, all animals, no matter what their real color, will seem to be of the same color; and no color can be imagined which will not become inconspicuous, whether on an animal or off an animal, if against certain backgrounds."

The principle of countershading, as set forth by Mr. Thayer, is next considered, and admitted as a discovery of real merit, but "although important as a coloristic law, has a very limited application among birds and mammals so far as concealing them is concerned....It does, however, I believe, play a certain small part, in some cases, even with birds and mammals, and possibly a far greater part with lower forms of life; and Mr. Thayer is entitled to full credit for calling attention to this fact. Unfortunately as regards mammals and birds, he has given it a

thousand-fold more importance than that to which it is entitled." This, we believe, must be the ultimate conclusion of intelligent field observers of wide experience on serious examination of the facts in the case.

The main contention of Mr. Roosevelt's paper is that concealment in birds and mammals is due mainly to "cover and habits." Birds of many species, living in all kinds of environment, and embracing all the leading types of bird life as regards size, habits, and habitats, and of mammals, from elephants, giraffes, zebras, antelopes, lions, cougars, skunks, marmots, squirrels, field mice, shrews, etc., are discussed at length with reference to Mr. Thayer's points of view. A few excerpts will show the method of treatment adopted by Mr. Roosevelt: "Now as to the insistance Mr. Thayer puts on some of his propositions. When he says that 'the striking patterns' and 'the utmost contrasts of color' on animals 'make wholly for their obliteration,' really the only way of answering him is by a negative. The red-headed woodpecker exactly fulfils Mr. Thayer's description of an animal with such a pattern and contrast of color. If in Mr. Thayer's eyes a red-headed woodpecker in its normal surroundings is inconspicuous there is no more to be said than we would say to a man who asserted that a large house standing alone on the prairie and colored half black and half white, with a bright red roof, was inconspicuous. . . . The red-headed woodpecker is one of the most conspicuous of all animate objects. Its habits are such that even a city-bred man must see this."

"Again, take what Mr. Thayer says of countershading, and of why a protectively colored animal escapes detection. Mr. Thayer insists that the animal escapes observation, not because its colors match its surroundings, or because it sits motionless like a stump, or clod, or some such inanimate thing, but purely because of its shading, which he says is rendered obliterative by the countergradation of shades, so that the eye does not recognize it as a solid object of any kind.' . . . This spring, once or twice after heavy rain I have seen meadow mice in unusually open spots where I could examine them having in view this matter of concealing coloration. When they move they are visible at once; when they are still they always crouch nearly flat — their short legs render this necessary — and there is then practically no effect of countershading; it is a

negligible element in concealing them; they are concealed because their dull colors, round contours, and absolute immobility make them look like lumps of mud, or other natural objects so that the eye fails to distinguish them from their surroundings, as one fails to distinguish a muddy tennis ball. On an absolutely flat and bare surface they are seen at once. . . . Where the color [white] is simply on the belly, it does not advertise the animal, merely because it is not seen; that is, instead of this coloration concealing the animal, the animal conceals the coloration, and it has no effect one way or the other."

The coloration of mammals in respect to their concealing or advertising qualities is discussed at great length (for about 40 pages), special attention being given to the larger species, as the giraffe, zebra, antelopes and deer of many species, and the carnivores, from the point of view of the author's wide personal experience as a field naturalist and hunter, with particular reference to such much-discussed species as the pronghorn, giraffe, zebra, lion, leopard, and cougar. In the course of this discussion he says: "The first, and by far the most important, fact brought home to any competent observer is that as regards the great majority of these animals the question of cover infinitely outweighs the question of coloration in the problem of concealment; this being so true that when there is no adequate cover most of the big animals do not trust to concealment at all, and concealment, whether of coloration or otherwise, plays no part in making their lives successful. Next comes the fact that there are some animals, chiefly cats, whose peculiar physical address in hiding and in stealthy approach and escape is such that their ability in this respect far outweighs the question of coloration, and even the question of cover, provided the cover is in any way adequate. Finally, there are some animals as to which it is possible that the coloration does have a concealing effect of some importance."

"The cougar," with which Mr. Roosevelt has had exceptional experience in its natural haunts, he views as "an interesting beast from every standpoint, including its coloration; and a study of the effect of its coloration from the 'concealing' standpoint is, or ought to be, illuminating, when taken in consideration with much that is written about the concealing quality of the coloration

of leopards, tigers and other cats. My experience, in accord with the experience of almost all other hunters and outdoor naturalists, is that the cougar is of all our American big animals the one most difficult to see and most rarely seen. The cougar's neutral-tinted, nearly unicolored, countershaded coat, unquestionably has a concealing quality, in the woods and among clay banks and rocks under ordinary conditions; and for a long time I, in common with most observers, accepted this as the chief element in explaining the way in which the cougar escapes observation. But when I came to think out the matter I realized that in many parts of its range the landscape is in winter snow covered, and that a totally different theory must be invoked for the cougar's invisibility when snow is on the ground." After detailing his experiences with cougars under these conditions he says: "This means that the cougar's coloration was really an insignificant and practically negligible factor in its concealment. The prime factors in keeping the cougar invisible were its nocturnal habits, its caution and wariness, its sharp senses, its wonderful ability to take even advantage of the scantiest cover, and its power of lying indefinitely motionless and of advancing with inconceivably noiseless and crouching stealth. . . . Furthermore the facts in the case of the cougar, an animal big enough to permit us to be certain just what the facts are, enable us to appreciate the real conditions which render it difficult to see so many smaller creatures."

The author presents his 'conclusions' (pp. 212–220) under eleven general statements, which we have not space here even to summarize. The ground is broadly covered, however, in statement 11, which we here transcribe:

"(11) In short, as one might anticipate, when we deal with the coloration of birds and mammals we deal not with any one cause, but with a varied and complex tissue of causes. Forces have been at work to develop concealing coloration in many species, and countervailing forces have worked with greater or less strength to counteract the influence of the first, in some species completely succeeding and in others partially succeeding. Some birds and mammals are so colored that normally or at certain important times their coloration helps to obliterate them from the sight of their foes. Others are so colored that their coloration under all normal conditions and from every viewpoint, and at the most

critical periods of their lives, tends to reveal them to their foes. In others the coloration is of little consequence, one way or the other. Birds and mammals living under precisely the same conditions have totally different types of coloration, and display totally different traits and habits when seeking to escape from enemies or to capture prey. No universal laws can be laid down. Tentatively, it is possible to give adherence to the conclusions which I have sketched in loose outline above. We know that many birds and mammals are concealingly colored. It is hard to say, at least in some cases, whether this concealing coloration has been produced by natural selection, or whether, however produced, it has merely then been taken advantage of by the animals, which have conformed their habits thereto, so as to get the utmost benefit from it. In many birds and mammals sexual selection or some similar principle has completely obscured in one sex the workings of the law which tends to produce concealing coloration. In many other birds and mammals both sexes are advertisingly colored, and whatever be the cause that has produced this advertising coloration it is evident that the circumstances of their lives are such, that their habits and traits of mind are such, as to render the question of concealing coloration a negligible element in their development.

"The species of birds and mammals with a complete obliterative, or concealing, or protective, coloration, are few in number compared to those which possess (either all the time, or part of the time, or in one sex for all the time or part of the time) a conspicuous or revealing or advertising coloration, and to those in which the coloration is neither especially advertising nor especially concealing. As regards the great majority of the species, the coloration, whether concealing or not, is of slight importance from the standpoint of jeoparding or preserving the bird's or mammal's life, compared to its cunning, wariness, ferocity, speed, ability to take advantage of cover and other traits and habits, and compared to the character of its surroundings."

In an Appendix of ten pages Mr. Roosevelt takes occasion to reply to Mr. Thayer's criticisms of Roosevelt's 'African Game Trails,' in one of the appendixes to which the author takes exceptions to Mr. Thayer's statements in his 'Concealing-Coloration

in the Animal Kingdom,' these strictures being characterized by Mr. Thayer as an "extraordinary tirade." Mr. Thayer's paper appeared in the July issue of the 'Popular Science Monthly,' after Mr. Roosevelt's article was already in type. Both papers are of course controversial and need not be further mentioned in this connection but both should be read by those especially interested in the problems of animal coloration.

In our mention of Mr. Thayer's book, 'Concealing-Coloration in Animals,' published in the April number, 1910, of this magazine (Vol. XXVII, pp. 222–225), the notice was purposely descriptive, from the view-point of the author, and non-critical. At the time it was written there had been time to give it only perfunctory examination, and while certain seemingly extravagant claims were noticed, there was then neither time nor opportunity to take up the work critically, owing to pressure of other duties. It was recognized, however, that to discuss the merits and demerits of the work would require not only a considerable outlay of time but an indefinite and very large amount of space for their presentation. Later it became evident, on further study of the work, that to review it on its merits would require the space of a booklet and a large expenditure of time. It seems therefore opportune that the task has been undertaken by a field naturalist of recognized fitness, through an experience with both large and small game of unequalled extent, amid not only natural but the most diversified surroundings. The tone of Mr. Roosevelt's paper is judicial and fair, personally kind toward Mr. Thayer, but outspoken and emphatic in criticising what he considers errors in his methods and conclusions. He does not lay claim to final judgment on points where it seems to him our knowledge is incomplete, and in such cases frankly says, 'I do not know,' and appeals to naturalist to further investigate doubtful points. He has endeavored to apply "common sense" to evident misstatements and the misapplication or misinterpretation of facts.

When in November, 1896, at a meeting of the American Ornithologists' Union in Cambridge, Massachusetts, Mr. Thayer gave a demonstration of his discovery of the effect of countershading,[1]

[1] See Auk, XIV, 1896, pp. 85, 86.

those who witnessed it were profoundly impressed and somewhat startled by what they witnessed. It was easy to recognize that Mr. Thayer had discovered a hitherto overlooked principle in optics which seemed to explain how the white underparts of terrestrial birds and mammals rendered them protectively colored. If objects like sweet potatoes suspended a few inches above the ground on a green lawn could be rendered invisible by painting their lower surface white, such markings on the ventral surface of animals must, it would seem, tend to their concealment. But when we come to study such animals in life it becomes apparent that their manner of living greatly qualifies its effectiveness for their concealment, especially in short-legged and crouching animals that live on the ground. Later, however, Mr. Thayer extended his experiments to the pattern markings of animals, and with artificially constructed backgrounds, or with favorably chosen natural backgrounds, was able to demonstrate the practical disappearance of animals with color patterns. This was all very striking and very interesting, and very few who witnessed his demonstrations reflected that the effects were produced through artificial environment, and really proved very little as to the effect of color patterns as a means of concealment in living animals in the actual or natural environment of the species. It showed possibilities that might never happen in life, or so rarely as to be negligible as a means of protection at even vital moments in an animal's career. Discovery of the possibility of finding backgrounds that will match the coloration of any or of every bird or mammal *when motionless* does not necessarily have an important bearing on protective coloration in animals, as has been well-shown in Mr. Roosevelt's illuminating paper. It is here that Mr. Thayer has been misled in his later investigations, as shown in his book on Animal Coloration and in his later papers in reply to his critics. This is unfortunate and to be greatly regretted, for only personal friendship has deterred many of his friends who differ from his conclusions and believe his methods of proof are seriously defective, from openly assuming the rôle of critic. For him to say he is misunderstood by his critics, and that they do not agree with him because they do not understand the 'laws of optics,' is a lame defense for the misconceptions with which his book and recent papers abound.

In an article by Mr. Thayer printed in the present number of this magazine (*antea*, pp. 460–464) we get perhaps a clearer view of what he *now* claims for his investigations than can be obtained from his book and previous papers. He says (*l. c.*, p. 463): "The oft-repeated objection that the wearers of these costumes perpetually reveal themselves by motion, and that consequently my tests give a wrong impression, is just what shows lack of taking in what my investigation is. My whole assertion is that the *costumes* of these creatures are not what reveal them, and the objector's repeated declaration that the real animal moves and shows himself simply backs me up. The use of motionless stuffed skins is the pure method of studying the effect of the patterns *apart* from that of motion. . . . The inevitability of *detection* through motion has made people suppose it was the *patterns* that caused the detection. What they *do* cause is *identification after* detection."

If animals with conspicuous patterns and contrasting colors were always *motionless*, and always chose for resting places backgrounds that match their patterns and conspicuous colors, Mr. Thayer's experiments with stuffed skins and carefully chosen or artificially prepared backgrounds would have some direct bearing on the question of the effect of such patterns and conspicuous and contrasting colors. But since an animal or bird however colored is apt to remain unseen if motionless, especially if physically screened in the least degree, and since most conspicuously colored animals invariably pass a large part of their time in the open and in motion, without the aid of any matching backgrounds, but exposed to an ever varying background, the utility of Mr. Thayer's "pure method of studying the effect of the patterns apart from that of motion" does not seem very evident, a point repeatedly urged by Mr. Roosevelt in the paper here under review.

GENERAL NOTES.

The Dovekie in Maine in Summer.— On July 15, 1911, while Mr. G. Gilbert Pearson and the writer were taking passage, with a local fisherman, from Machias Seal Island, which is about twelve miles south from Cutler, Maine, when about half way between the Seal Island and Cross Island, Me., or about six miles from either point, we came upon a pair of Dovekies (*Alle alle*) swimming in close company. We found them in one of the eddies of the numerous tide rips, caused by the tidal currents of the Bay of Fundy.

They proved to be a male and female in an interesting stage of plumage. The head, neck, underparts, interscapular region, and tertials of the male were of the nuptial plumage, the neck entirely around being uniformly velvety, sooty brown. The rump and tail were of the winter plumage, faded grayish, and worn. The wings were much worn, some of the primaries with bare shafts for half their length.

The female was similar, except that the winter plumage remained over the entire back behind (caudad) the scapular region; the rectrices had been renewed. The throat and sides of the neck, at the place of the winter half-collar of white, were well sprinkled with white.

Though two leading manuals make no distinction between the sexes, this last feature had the appearance of a sex character, and the female was noticeably smaller than the male.

Though the birds were in fair bodily condition and had not been crippled they showed no indication of breeding, and it is doubtful if they could have flown.

I am told by Capt. Merton Tolman, until recently keeper of Matinicus Rock light station, a man whose word in such a matter is not to be doubted, that during the summer of 1910, one of these birds was frequently seen near Matinicus Rock.

So far as known to me, these are the only instances recorded, of the verified occurrence of the bird in summer south of Newfoundland. (*Cf.* Townsend and Allen, Proc. Boston Soc. N. H., XXXIII, p. 309.)— Arthur H. Norton, *Portland, Me.*

The Greater Shearwater on the Coast of Georgia.— On June 11, 1911, I found a dead bird on the beach at Tybee in an advanced state of decomposition. The head only was saved and has been identified by Prof. W. W. Cooke as the Greater Shearwater (*Puffinus major*). As this is the first record of the species in this State he suggests my sending the record for publication in 'The Auk.'

It may be of interest, too, to note a second breeding record of the Savannah Sparrow on Tybee Island. The locality was about half a mile from the nest recorded last year (Auk, XXVII, p. 458), and, as in that case,

contained nearly fledged young. It would not have been discovered but for the twittering of the nestlings when being fed by the parent bird. The nest was merely a few straws in a depression of the ground in the middle of a large tuft of "bunch grass."— W. J. Hoxie, *Savannah, Ga.*

Pomarine Jaeger Capturing a Phalarope.— An interesting account of a Pomarine Jaeger capturing and devouring a Phalarope has just been presented to me by a friend, Mr. Allan Moses of Grand Manan, N. B. Mr. Moses and his family for three generations have been taxidermists and students of ornithology and I have always found their observations accurate and their accounts reliable. Mr. Moses was fishing several miles off shore at the time and apparently there were numerous Northern Phalaropes in the vicinity. He writes: "I saw something last Friday that I never saw or knew anything about before. I saw a Pomarine Jaeger catch a phalarope. There was a pair of the jaegers. The female started after the phalaropes and chased them a long time. They were too smart for her, and after a long chase, she separated out one, and then the male gave chase, and in a few minutes with the two chasing the little fellow, one caught him within a hundred yards of the vessel; then they both lighted in the water and ate him."

This letter was dated May 31, and "last Friday" would be the twenty-sixth, making the date of the observation, May 26, 1911.— Albert W. Tuttle, *Boston, Mass.*

Egrets (*Herodias egretta*) **in Massachusetts.**— On August 9, 1911, I secured an Egret from a flock of six on the Eastham Marshes of Cape Cod. The birds had been feeding far out on the open mud flats, but luckily for me approached some "hummocks" of grass behind which I was able to stalk them. Mr. Matthew Luce, who has a house commanding a fine view of the marsh, had been seeing them intermittently since about July 21, and on several occasions approached within a few yards of them. Walter Nickerson, the game warden, had also been watching them and said they always roosted together in a certain tree at a nearby Night Heron colony.— Stanley Cobb, *Milton, Mass.*

The Egret in Plymouth County, Mass.— On July 27, 1911, I saw two Egrets (*Herodias egretta*) in the salt marsh near the mouth of North River, which is the boundary between the towns of Marshfield and Scituate on the south shore of Massachusetts. They were catching fish, and permitted a fairly near approach. Neither had plumes. They were still at North River on August 6.

On July 30 I saw an Egret in the southern part of the town of Plymouth. This bird was catching frogs and fish at a small pond but a short distance from farm buildings. When I startled him, he flew up into a hillside pasture close by. The tall white wader presented a striking and unique

appearance as he stood up "straight as a major" in the huckleberry bushes on the hot sunny hillside. He was quite fearless and soon flew down to resume feeding in the ditch of a near-by cranberry bog.

On July 22 Mr. F. D. Lyon of Halifax saw at a pond-bottom in his town another Egret which, like the three birds already noted, was plumeless.

Thus within 10 days four Egrets were noted in Plymouth County, at points rather widely separated, the North River being over 25 miles from the South Plymouth pond and over 12 miles from the Halifax pond-bottom, while this latter point is over 20 miles from the south Plymouth locality. Halifax lies eight miles inland; the South Plymouth pond is within two or three miles of the sea.

I am informed on good authority that an Egret was seen about 10 years ago at North River. Mr. Thomas W. Graves of Plymouth tells me that he also saw an Egret at Yarmouth on Cape Cod a number of years ago. This bird had the plumes.— J. A. FARLEY, *Plymouth, Mass.*

The Egret at Marshfield, Massachusetts.— The town of Marshfield is situated about thirty miles southeast of Boston bordering on Massachusetts Bay. There is a considerable stretch of salt marshes with a number of small ponds or pools scattered here and there. It is an ideal place for water birds.

On July 30, 1911, in company with Mr. Joseph A. Hagar of Marshfield and Mr. Harold D. Mitchell of Newtonville, I observed a pair of Egrets (*Herodias egretta*) feeding in one of the numerous pools on the marshes at Marshfield. We first saw them from a hill about three-quarters of a mile away. Under the cover of bushes and stone-walls we approached to within about four hundred feet, then, at times crawling flat on our stomachs, Mr. Hagar and I gained the shelter of a blind, not over two hundred feet away from the birds.

With the Egrets was a Great Blue Heron (*Ardea herodias herodias*) which remained perfectly motionless on the bank, while the others were nervously moving about. Comparing them with the Blue Heron, they appeared to be rather smaller; in form similar, but more slender, especially the neck. The entire plumage was pure white, the bill bright yellow, and the legs and feet black. When they saw that they were observed they became very restless and shy and kept walking up and down the bank with quick, graceful steps. One was always on watch while the other was preening its plumage or catching fish. Several times they ran quickly towards each other and with outstretched wings, and in a rather ludicrous manner, bobbed, bowed and touched their bills together. At this time we thought that we saw two or three "aigrette" plumes on the back of one of the Egrets, but of this we were not certain. They were altogether silent while we were near.

Their movements and flight were more graceful and agile than those of the Blue Heron and their snow-white plumage showed up very plainly

against the dark background. We observed the Egrets for over an hour and have no doubt of their identification. They were *not* albino Blue Herons.

After I had returned home to Jamaica Plain, Mr. Hagar wrote me a letter, dated August 13, from which I take the following: "Two days later, on August 14, I was fortunate enough to approach them (the Egrets) within one hundred and thirty feet by actual measurement, first on foot and then in a ducking boat. This time they were feeding along the bank of the river and were much less wild. The night of August 1 they changed their feeding grounds to the Scituate side of North River, about five miles north of where we first saw them. They were reported by various persons for almost a week before I saw them again. They were usually seen feeding on the marshes or perched in some large dead tree along the edge of the marsh. On August 5 I saw them late in the afternoon and for the first time heard their note, a harsh guttural 'squawk,' not unlike the note of the Black-crowned Night Heron (*Nycticorax nycticorax nævius*).

"On August 8, while out in a dense fog on the marshes, I heard a hoarse squawk and looking up, saw the Egrets directly overhead. That day either they parted company or one was shot, for the next morning one was seen on the marshes and another (or perhaps the same one, in the former case) on the shore of a little pond seven or eight miles back from the coast. The next night they disappeared, nor have I heard of them since."

The 24th of July a local gunner told Mr. Hagar that a few days previously he had seen a pair of "White Herons" with several Great Blue Herons near the mouth of the North and South Rivers in Scituate. This would indicate that the Egrets had been in the vicinity for about a month at least.

From the 'Birds of Massachusetts,' by Howe and Allen (1901), page 45: "*Ardea egretta*. American Egret. An occasional summer visitant. Records from: Ashland, Dedham, Hudson, Ipswich, Lynn, Nantucket, North Hadley, Plymouth, Quincy, Springfield, Topsfield, Wellesley, West Brookfield, and Westford. Last record: Nantucket, one taken Sept. 23, 1890 (Auk, Vol. VII, Jan., 1891). Apr., May, Aug., Sept., Nov."

Marshfield is a new town and July a new month for their appearance, and 1890 is the latest year that I find any authentic record of Egrets in Massachusetts.— HAROLD L. BARRETT, *Jamaica Plain, Mass.*

The Black-bellied Plover in Center County, Pa.— The rarity of the Black-bellied Plover in the interior counties of Pennsylvania makes it desirable to place on record the capture of a specimen near State College, Pa., on Sept. 3, 1909. At the time of its capture the bird was in company with a small flock of Killdeers on a small hillside above a swamp. The bird is a young male and is at present in the collection of the writer.— RICHARD C. HARLOW, *State College, Pa.*

Rough-legged Hawk (*Archibuteo lagopus sancti-johannis*).— On March 25, 1911, while on Protection Island, Straits of Juan de Fuca, I picked up a dead bird of this species that had been shot by some gunner. It had not been killed more than a few days and was apparently an adult male in the light phase of plumage but was too much decomposed to prepare.— S. F. Rathbun, *Seattle, Wash.*

Buteo platypterus Eating Minnows.— The intense and prolonged dry spell has dried, among others, the creek Rio Seco on the San Carlos estate; water being found only in two or three shallow puddles 6 or 8 feet long by half as broad and 4 inches deep, at deepest. These puddles were alive with small minnows known locally as "Guayacones."

On April 9, 1911, I shot from a tree near one of these puddles a female Broad-winged Hawk (*Buteo platypterus*). Upon examining her crop I was surprised to find 16 whole minnows from ½ to 1½ inches long, which she had just eaten. Unfortunately I did not witness the fishing process.— Chas. T. Ramsden, *Guantanamo, Cuba.*

The Black-billed Cuckoo (*Coccyzus erythrophthalmus*) **Breeding on the Coast of South Carolina.**— On May 10, 1911, while in company with Mr. J. H. Riley, who had come to South Carolina with Dr. Edgar A. Mearns and Mr. Edward J. Brown to collect topotypes of birds for the Smithsonian Institution, I took an adult female *Coccyzus erythrophthalmus*, which was the first specimen I had ever seen alive. Upon examining the bird I found the lower breast and abdomen completely denuded of feathers showing that incubation was going on, but although we searched the swamp carefully for the nest we were unable to find it.

On May 12 I again visited the swamp, accompanied by a colored boy, and shot another female within one hundred yards of the spot where the first bird was taken. This bird had the lower breast and abdomen bare showing that it was incubating, and dissection proved, in both cases, that all the eggs had been laid.

Dr. Mearns accompanied me to the swamp on May 13 with the intention of hunting the greater portion of the forest critically for the nests, as well as to secure other birds of this species, but although we took two specimens of *C. americanus* we were unsuccessful in finding the other species, or its nest. The bodies of both specimens of *erythrophthalmus* are in the Smithsonian Institution, and the skins are in my collection.

Mr. Gilbert R. Rossignol, Jr., of Savannah, Georgia, writes me that Mr. F. N. Irving (also of Savannah) took a specimen of *C. erythrophthalmus* at Sand Island, Beaufort County, S. C., on April 23, 1911, which is now in my collection; also a specimen from Savannah taken April 9, 1911, by Mr. Rossignol, both of which he kindly presented to me. The capture of the two females of *Coccyzus erythrophthalmus*, by the writer near Mount Pleasant, makes the first authentic breeding record for the State.— Arthur T. Wayne, *Mount Pleasant, S. C.*

Northern Flicker (*Colaptes auratus luteus*) **in San Juan County, Wash.**— A typical specimen, an adult male, was taken Oct. 15, 1907, on Orcas Island, in San Juan County, Wash., one of the islands of the San Juan group in Puget Sound. It was brought me and the skin was forwarded to Washington, D. C., for further identification, and pronounced as above.— S. F. Rathbun, *Seattle, Wash.*

Numbers of the Meadowlark still Increasing in Maine.— In this part of Maine, at least, there continues to be an increase in the numbers of the Meadowlark (*Sturnella magna magna*). On Oct. 12, 1910, I found near Winnock's Neck, Scarboro, many more Meadowlarks than I had ever seen in one day before. Flock after flock was flushed, as I walked over the marshes, and there could not have been less than two hundred birds. This is a remarkable number in the case of a species which was uncommon a few years ago and was once a rarity.[1]

About fifty Meadowlarks remained near Pine Point railroad station until late in November, 1910; but only about twenty passed the entire winter of 1910–1911 near here,— fewer than stayed through the previous winter.[2] — F. S. Walker, *Pine Point, Maine.*

The English Sparrow at Tucson, Arizona.— The popular side of bird life is to anathematize the so-called English Sparrow. If it has a known virtue it is kept sedulously in the background, but inasmuch as the complaint is general it is barely possible that they are entitled to the total sum of badness heaped against them, but the rule is rare that has no exception. The English Sparrow (*Passer domesticus*) was first noticed in Tucson about seven or eight years ago. But where they came from, and how they came the writer does not know, but he does know that they did not come in from the west. They breed continuously from early spring to late midsummer. March 23 the writer saw young birds as large as their parents and to the writer's knowledge they are still (July 12) breeding. Nest-making appears to be going on much of the time, both male and females being engaged in the work, but the number of times they breed the writer has no means of knowing. One curious phase of the business is their scarcity in winter. In summer they are so numerous as to be seldom out of sight, but in the winter a drive over the town will not discover a half dozen. In Tucson it rarely snows, but if such thing should happen it instantly melts on touching the ground. Occasionally when a cold wind blows from the mountains freezing point will be reached, but seldom more. Cold weather can therefore be no motive for their scarcity. It is possible they scatter over the desert, but I am much in the country and do not often see them. April 16 last, the writer saw one, a male, at Oracle, a small town in the western foothills of the Santa Catalina Mountains,

[1] Norton, Auk, XXVI, pp. 307, 308.
[2] Auk, XXVII, p. 341.

40 miles north of Tucson. Undoubtedly there were others, but they were not noticed, and none were seen along the road. In the immediate vicinity of the town a few can occasionally be seen, but not one in ten in proportion to the other sparrows. Word has been received here that they have reached the Colorado, 250 miles west of here, but the report lacks confirmation by authority. Most certainly they were not there four years ago.

The almost universal complaint that they drive away other birds will not hold good hereabouts. During the past four years, while under the observation of the writer, but two disagreements have been noted and in each case it was among themselves. In no single instance has trouble with native birds been seen, although the town is full of them. The Inca Dove is a common resident at all times, and during the so-called winter months are more common on the streets than the English Sparrow. There is scarcely an hour in the day when one or more of them cannot be heard calling in the trees, but never on the ground. Frequently during the early spring mornings, a number of them will be calling at the same time and each one apparently angry with the other. The Mexicans interpret the call as "Pobre Cruz, pobre Cruz," *Poor cross, poor cross*, and because of this apparently reverential sentiment they are frequently used as cage birds. They nest in the town and are much more demonstrative so far as noise is concerned than all the sparrows in the country. The House Finch is likewise a common resident and breeds by the score within the limits of the town. Occasionally I have seen them feeding with the sparrows without interference in either direction. Bullock's and Hooded Orioles, Arkansas Flycatchers, Phainopeplas, Vermilion Flycatchers, Wrens and two species of Hummingbirds are known to nest in the town, and almost every other kind of bird in the country can occasionally be heard or seen in the trees. Twice the writer saw a female Bullock's Oriole scatter a bunch of sparrows that were feeding on the street. Each time it struck and knocked over a sparrow in the center of the bunch, and on each occasion the sparrows were, or appeared to be, badly frightened. Probably there had been previous attacks as my attention was called to the matter by the outcries of the sparrows. I do not know what had been done to incur the fighting displeasure of lady Oriole, but instead of resenting the insult they flew into a tree on one side of the street and the Oriole returned to her tree on the opposite side. On another occasion I saw a young male Cowbird busy with a piece of bread in the street. It was soon joined by a female English Sparrow which seemed anxious to get a share of the bread, but did not venture the attempt. It hopped entirely around the diner at a distance of about two feet, although the other bird paid no attention to it. Although I am frequently in the University grounds, about a mile from the business center of the town, I have thus far not seen one of the objectional sparrows, but the other birds of the country are there in great numbers. The same can be said of the Santa Cruz Valley, a portion of which is covered by the residential portion of the town. Throughout the winter months the vacant weed-growing lots about town

are patronized by hundreds of sparrows. Gambel's, White-crowned and Chipping Sparrows make up the numerous small flocks, but so far as I know I have never seen an English Sparrow among them.— HERBERT BROWN, *Tucson, Arizona.*

White-crowned Sparrow in Cuba.— I beg to report having secured on March 22, 1911, a female White-crowned Sparrow (*Zonotrichia leucophrys leucophrys*) on the San Carlos estate at Guantanamo. The bird was in fine plumage and not at all shy. This seems interesting to me, as Dr. Gundlach in his long experience on this island never met this species.— CHARLES T. RAMSDEN, *Guantanamo, Cuba.*

The Scarlet Tanager (*Piranga erythromelas*) **on the Coast of South Carolina.**— On April 16, 1911, Mr. J. H. Riley observed, while *en route* to my house, accompanied by Dr. Mearns and Mr. E. J. Brown, a male of this exquisite bird about five miles from Mount Pleasant, and on May 4 I secured a superb male while in company with Dr. Mearns. During all the years I have spent observing birds on the coast this specimen makes the third that I have seen, the migration being more than one hundred miles away from the coast, as it is known to be rare a few miles south of Columbia.— ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Rare Swallows in Georgia.— It is with pleasure that I report the capture of two Bank Swallows (*Riparia riparia*) on Sept. 1, 1911. This being the second record for the State.

On Aug. 20, 1911, I saw three Cliff Swallows (*Petrochelidon lunifrons*) on a telephone wire and to-day (Sept. 1) Mr. W. J. Hoxie observed 10 or 12 flying about in a vacant lot in the city of Savannah. The Cliff Swallow is a rare migrant here.— G. R. ROSSIGNOL, JR., *Savannah, Ga.*

A Peculiar Variation in the Louisiana Water-Thrush (*Seiurus motacilla*).— Of an adult female taken by the writer on March 29, 1911, near Mount Pleasant, the outermost rectrices on each side are narrowly tipped with white on the inner webs, while the next rectrix, as well as its fellow, is broadly blotched with white; the third pair have a streak of white extending along the shaft. Mr. W. F. McAtee has recorded[1] a similar case in *Seiurus noveboracensis notabilis.*

In almost all the spring specimens that I have taken in South Carolina there is a *conspicuous* median stripe of buffy white on the pileum extending past the eye. This median stripe is also present in autumnal specimens, but concealed, and its conspicuousness in spring examples is due to the wearing away of the tips of the feathers of the pileum, as there is no spring moult in this species. The presence of this median stripe is not mentioned by Mr. Ridgway.[2]— ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

[1] Auk, Vol. XXI, 1904, pp. 488, 489.
[2] Birds of North and Middle America, Part II, 1902, p. 639.

Nests of the San Nicolas Rock Wren.— On June 24, 1911, I secured a set of four very badly incubated eggs of the San Nicolas Rock Wren (*Salpinctes obsoletus pulverius*). The nest was made of grass, upon a base of flakes of sandstone; the latter laid in the bottom of the nest cavity and the grass nest proper built upon them. The nest cavity was seven feet up, in the side of an immense boulder that had fallen from the cliff above the cañon-side upon which the boulder lay. The nest was visible from the ground, and was very similar to that of the House Finch (*Carpodacus mexicanus frontalis*); in fact I nearly passed it by for that reason.

This is the second nest of this wren that I have examined. The first (recorded in 'The Condor') was situated under the eaves of a store-house within fifty feet of the ranch house, and contained four young birds, June 21, 1911. The parent birds and young were observed returning to the nest each night and leaving every morning, after the young were fully fledged and well grown. This nest was the counterpart of the other; grass, upon a base of small flakes of sandstone.—C. B. Linton, *Long Beach, Calif.*

The Bewick's Wren in Center Co., Pa.— A fine male Bewick's Wren was observed about three miles south of State College, Pa., on April 24, 1910. The bird was not at all wary and the perfect identification made the collecting of the specimen unnecessary. The Bewick's Wren is an extremely rare visitor in Center County, though further to the westward in the State it is of more regular occurrence.— Richard C. Harlow, *State College, Pa.*

Wood Thrush at Newbury, Vt.— I have spent my summers since 1905, from June to October, in the town of Newbury, Vt., on the Connecticut River, five miles south of Wells River, and twenty summers previous at Lake Willoughby, Vt. Before 1910 I had never identified a Wood Thrush at Newbury, though the Wilson and Hermit Thrushes were quite common. During the summer of 1910 two Wood Thrushes were identified in the same part of the town where the other thrushes were found.

This year, 1911, there is a noticeable increase of Wood Thrushes. I have seen them in both localities and should say they were from 6 to 8 birds singing where last year only two were identified.

In the late afternoon, of July 1 there was a fine concert by the Wood, Wilson, and Hermit Thrushes in one locality, with a specially fine performance by the Wood Thrush.— Anna E. Cobb, *Newbury, Vt.*

Note on Two Unrecognized Forms of North American Birds.— Jamaica, or at least the West Indies, is supposed to be the type locality of *Melopelia asiatica* (Linnæus). Comparison shows that the bird from the southwestern United States and northern Mexico is slightly larger, with a much longer bill and much paler coloration than the West Indian bird.

Therefore, in the 'A. O. U. Check-list,' the White-winged Dove of the United States should stand as *Melopelia asiatica trudeaui* (Audubon).[1] Type locality, "Texas."

It also seems desirable to recognize a pallid western form of the Mourning Dove, ranging from the Pacific Ocean and San Clemente Island eastward across the United States and northern Mexico to the Mississippi Valley, as *Zenaidura macroura marginella* (Woodhouse).[2] Type locality, "the cross timbers, on the north fork of the Canadian River, Oklahoma. — EDGAR A. MEARNS, *U. S. National Museum, Washington, D. C.*

Lark Bunting in New Brunswick.— August 15, 1910, a young male Lark Bunting (*Calamospiza melanocorys*) was shot by Allen J. Moses at Nantucket, a small island near Grand Manan, New Brunswick. The bird was determined by Dr. Glover M. Allen of the Boston Society of Natural History who stated that this was only the fourth record of this species in the East, the others being from Massachusetts, Long Island and South Carolina.— ELIZABETH M. DUNHAM, *Auburndale, Mass.*

Some New Birds for Colorado. BLACK-THROATED GREEN WARBLER (*Dendroica virens*).— Adult female taken by the writer at Barr Lake, Colo., May 20, 1909.

BUFF-BREASTED SANDPIPER (*Tryngites subruficollis*).— Two taken by the writer at Barr Lake Aug. 25 and Sept. 4, 1910, out of flocks of 3 and 5 respectively. This Sandpiper is one Professor Cooke had previously predicted would some day be taken in Colorado.

MOTTLED DUCK (*Anas fulvigula maculosa*).— This bird was taken by Mr. W. N. W. Blayney near Loveland, Colo., in 1907. It is a beautiful male bird in fine plumage. It was identified by Mr. H. C. Oberholser, also by Prof. Wells W. Cooke who writes me this is the first sure record of *maculosa* for Colorado.

All three of these species are in the Colorado Museum of Natural History. — L. J. HERSEY, *Curator of Ornithology, Colorado Museum of Natural History, Denver, Col.*

Notes on Rare Species in Eastern Missouri.— On July 2, 3 and 4, 1911, I took a canoe trip down the Meramec River from Steelville in Crawford County to Moselle in Franklin County,— Steelville being about eighty miles and Moselle about forty miles southwest of St. Louis. The Ozark border region, through which the narrow and rapid stream flows, is

[1] Birds of America, VII, 1844, p. 352, pl. 496.
[2] Proc. Acad. Nat. Sci., Philadelphia, 1852, p. 104.

heavily wooded and hilly. Limestone cliffs, 100 to 250 feet in height, rise sheer from the river at many points. The region is but very rarely visited by any observer with an eye for birds, and it yielded, in a list of seventy-odd species, the following interesting notes:

Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*).— July 3 in Crawford Co., on the banks of the Meramec River, about sixty miles southwest of St. Louis, a male Yellow-headed Blackbird in full plumage and song. I was unable to locate others of the species, although inquiry among farmers nearby elicited the information that a dozen pairs or so had been seen regularly at that particular place for the past six or seven years. They stated the birds always disappeared early in July. They were well enough known to have the local name of "Indian Blackbird."

There is no previous record of Yellow-headed Blackbirds in the breeding season so far east in Missouri.

Duck Hawk (*Falco peregrinus anatum*).— July 3 in Crawford County on the banks of the Meramec River, one splendid specimen of a Duck Hawk, which followed our canoe for a quarter of a mile, screaming and swooping, and occasionally alighting on dead trees on the rim of the limestone cliffs, 200 feet above us. It is probable that there was a nest at some point along the cliff, though a careful search with the glass failed to locate it.

Duck Hawks are decided rarities now in Missouri. Dr. Otto Widmann states that a few pairs used to breed along the Mississippi and Missouri Rivers up until the early 90's, but none has been seen since. He says (Birds of Missouri, 1907): "There may be still a few pairs nesting in out-of-the-way places in the Ozarks." This observation confirms that opinion.

Egret (*Herodias egretta*).— July 3 on the Meramec in Crawford County, a pair of Egrets in perfect plumage, both of which flew up from the shore into a dead tree and remained in full view for three or four minutes as our canoe glided by them.

Inquiry of the men along the river, engaged in floating tie-rafts to points on the railroad, brought out the information that "White Cranes" are seen occasionally along the upper reaches of the river,— sometimes two or three times a year, but usually once in every three or four years.

Egrets used to breed not uncommonly in eastern central Missouri, but none have been noted in former breeding places since 1900. (Widmann, Birds of Missouri.)

Blue-winged Teal (*Querquedula discors*).— July 2, 3 and 4 on the Meramec River at four different points in Crawford and Franklin Counties, four Blue-winged Teal,— a pair and two single individuals; also noted several of the species on this river in Franklin County early in September, 1910. Blue-wings have become very rare during the breeding season in Missouri. The last record (Widmann) is June 17, 1906.

Northern Pileated Woodpecker (*Phlæotomus pileatus abieticola*).— One male in Franklin Co., about fifty miles from St. Louis, on July 4, in oak woods along the Meramec River. The Pileated has become very rare

in central eastern Missouri during the last twenty or thirty years. Rivermen along the upper Meramec report seeing it occasionally.— ROGER N. BALDWIN, *St. Louis, Mo.*

New Greenland Records.— My attention was lately directed to a European pamphlet entitled ' Dansk Ornithol. Foren Tidskrift,' IV, p. 130, where by an author, O. Helms, under the caption ' Nye Arter for Östgrönland,' four species are enumerated as having been taken in East Greenland. Two of them, *Marila marila* and *Falco peregrinus*, are known to have been taken there in previous years. The other two, *Podiceps griseigena* and *Totanus calidris* are new to the A. O. U. Check-List. Although *Totanus calidris* had been added in the past *ex hypothesi*, it is not as yet in the List proper. I propose that they be added to the Check-List, the first after *Colymbus holbœllii* (2.1), the second as *Totanus totanus* (255.1).— W. F. HENNINGER, *New Bremen, Ohio.*

Notes on Birds of Seattle, Washington.— Although the Oregon Jay (*Perisoreus obscurus obscurus*) is a not uncommon species in this locality from October until April, and quite often observed during the breeding season, there is no record to my knowledge of its eggs having been taken in this State, although D. E. Brown, of Seattle, states that a few years ago he found a nest containing young.

On April 18, 1909, the writer while looking through a dense strip of second growth of young red firs (*Pseudotsuga mucronata*) in a heavy wooded tract a few miles east of the city, found a nest of this species. The young fir in which it was built was alongside an old and seldom used path through the second growth, on the edge of a small open space about ten feet in diameter, having a further undergrowth of salal (*Gualtheria shallon*) and red huckleberry (*Vaccinium parvifolium*) shrubs. The tree was five inches in diameter tapering to a height of thirty-five feet, and the nest was placed close against its trunk on four small branches, at a height of twelve feet. It was outwardly constructed of dead dry twigs, next a thick felting of green moss into which was interwoven some white cotton string, and was lined with dry moss, a little dead grass and a few feathers, among the latter some of the Steller's Jay, and is a handsome compact affair. Dimensions: average outside diameter 6½ inches, inside diameter 3½ inches; depth outside, 5 inches; inside 2 inches.

The eggs, three in number, were perfectly fresh, of a grayish cast and rather profusely covered with fine specks and spots of a grayish brown and dark brown color, mostly distributed on the larger ends. Measurements are: 1.01 × .77 inch; 1.05 × .76 inch; 1.03 × .76 inch.

From observation of this species a larger number of individuals may breed in this immediate locality than is generally supposed, but as it is a shy retiring bird during the nesting season, restricting itself to the dense timbered districts, its nest no doubt will remain hard to locate.

The following additional species have been noted since the publication in 'The Auk' (Vol. XIX, No. 2, April, 1902, pp. 131–141) of the 'List of Land Birds of Seattle' and can therefore be added thereto. The numbers are a continuation of the original List.

113. **Melopelia asiatica.** WHITE-WINGED DOVE.— One specimen, now in my collection, a female taken Nov. 11, 1907, at Puyallup, Wash., 25 miles south of Seattle, by J. H. Bowles of Tacoma. This may be regarded as accidental and is so noted in the A. O. U. Check-List.

114. **Accipiter cooperi.** COOPER'S HAWK.— Rare summer resident. Breeds. Observed a number of times: August, 1908, May 22, 1909, May 7, 1911.

115. **Astur atricapillus striatulus.** WESTERN GOSHAWK.— Rare. Have a fine specimen, an adult male, taken east of the city, April 27, 1909.

116. **Strix occidentalis caurina.** NORTHERN SPOTTED OWL.– Probably not uncommon, but owing to the extent and density of our forests is hard of observation. An adult female in my collection bears date of Oct. 27, 1907, taken near Seattle.

117. **Loxia leucoptera.** WHITE-WINGED CROSSBILL.— Numbers of this species, associating with *L. curvirostra minor*, were observed in the vicinity of this city from December, 1908, until the following April (1909), but although carefully watched for since, I have been unable to get other records. Must be regarded as an irregular winter visitant.

118. **Junco hyemalis hyemalis.** SLATE-COLORED JUNCO.— On Feb. 4, 1909, J. H. Bowles of Tacoma took an adult male of this species which he kindly presented to me.

119. **Melospiza lincolni striata.** FORBUSH'S SPARROW.— An adult male, taken near Tacoma April 14, 1908, by J. H. Bowles is the only record of the species for this immediate vicinity.

120. **Passerella iliaca fuliginosa.** SOOTY FOX SPARROW.— One specimen, an adult male, taken by J. H. Bowles April 2, 1909, in Tacoma.

121. **Passerella iliaca insularis.** KADIAK FOX SPARROW.— An adult female taken by J. H. Bowles, Feb. 13, 1909, near Seattle (Kirkland, Wash.).

Undoubtedly this and the preceding species occur irregularly during the spring and fall migrations and may be winter residents to some extent, and there is a possibility that *fuliginosa* may breed in this district as it is known to do so along the coast of N. W. Washington.

122. **Tachycineta thalassina lepida.** NORTHERN VIOLET-GREEN SWALLOW.— Was inadvertently omitted from the original list. An abundant summer resident, in and about the city, breeding everywhere in suitable locations.

123. **Bombycilla garrula.** BOHEMIAN WAXWING.— On the morning of Dec. 4, 1910, a most beautiful Bohemian Waxwing in high plumage was observed feeding on the berries of a mountain ash tree in my front yard. This bird remained on the premises until 5 P. M., but returned the following day at 7:45 A. M. and stayed continuously in the yard until

4:30 P. M. The following day it again returned about noon, remaining until dusk. As the mountain ash trees were likewise occupied by upwards of a hundred Western Robins, also feeding on the berries, the supply became exhausted and all the birds left. The Waxwing was entirely unsuspicious, allowing me to approach within three feet, and even then showed no signs of alarm, thus giving an exceptional opportunity for observation.

On February 15, 1911, I noted a flock of about thirty-five of this species in the southern part of the city, and again on March 8, a flock of upwards of forty.

124. **Vireosylva olivacea.** RED-EYED VIREO.— A rare summer resident, partial to certain localities, in such however its characteristic song can be heard each season.

125. **Regulus calendula grinnelli.** SITKA KINGLET.— Regular early spring and late autumn migrant.

126. **Planesticus migratorius migratorius.** ROBIN.—Among the flocks of Western Robins so common during the winter months, occasionally are seen individuals undoubtedly of this species. In my collection is a perfectly typical specimen of *migratorius* taken in this locality.— S. F. RATHBUN, *Seattle, Wash.*

Professor Whitman's Collection of Pigeons.— Biological investigators will be glad to know that the large and valuable collection of pigeons and birds which were the basis of nearly a score of years' work of the late C. O. Whitman are being maintained and kept together. The material upon which Professor Whitman's extensive evolutional and natural history investigations were made will thus be available while his manuscripts and records are being arranged for publication.

Very abundant material is at hand for a continuance of studies on hybridization, sex, fertility, instinct, etc., more than is now utilized to its full advantage.

Mrs. Whitman has arranged, as long as it is utilized, to keep together this material, priceless from its history, some of the birds having pedigrees reaching back for a long series of years. The collection has been gathered from all parts of the world, not only through long years which consecration to the work could alone have made possible, but also at great expense of money which could be made use of only through sacrifice. Those who know best what this has been feel that the collection must be kept to be utilized as long as it will serve its purpose.

It was only in the last months of Professor Whitman's life that facilities for experiments and observation on a much larger scale were secured through the efforts of friends who put at his service the piece of ground adjoining his residence. He at once had built a large number of new cages; and delighted with the prospect of the enlarged opportunities declared that his real work he was just about to begin and that "five years will show."

For these reasons and because Professor Whitman's work became more illuminating as he went on, his family and friends feel that the opportunities so untimely left should be extended to others who wish them. Quarters are also given in the residence alongside the nearly one thousand birds, and Dr. Riddle, now at work with them, will cooperate with the work of others, or assist, or direct, as needed.

The library, which is one of the largest and most complete of biological libraries, is held open for constant use. The volumes are very extensively marked; pencil notes often bringing together from all quarters the various facts bearing on the subject under discussion.—*Science*, N. S., Vol. XXXIV, No. 866, pp. 145, 146, August 4, 1911.

RECENT LITERATURE.

Mathews's Proposed Changes in the Nomenclature of Birds.—Mr. G. M. Mathews has recently undertaken a revision of the nomenclature[1] of his 'Handlist of the Birds of Australia,' issued in January, 1908. The changes here proposed affect a large number of genera and a considerable number of species, the former including in many instances wide-ranging groups. In the same connection he also discusses incidentally a number of genera that are not Australian. His inquiry has thus a wide scope, and is prosecuted in the hope of increasing stability in nomenclature.

He says (Emu, *l. c.*, p. 317): "I have recognized that the only means of attaining finality in the nomenclature is the acceptance of the laws formulated by the International Congress of Zoölogists." In the 'Handlist' he followed Sharpe's 'Handlist of the Genera and Species of Birds,' and thus took the XIIth instead of the Xth edition of Linné's 'Systema Naturæ' as the "commencing point of binomial nomenclature." Many of his present "alterations" are due to this change. Others are due to his rejection of all generic names founded by non-binomial authors, including upward of forty proposed by Brisson. He gives as one of his "general rules": "*Non-binomial authors have been ignored.*" Among

[1] On Some Necessary Alterations in the Nomenclature of Birds, By Gregory M. Mathews. I. Novitates Zoologicæ, Vol. XVII, Dec., 1910, pp. 492–503; II. *Ibid.*, Vol. XVIII, June, 1911, pp. 1–22.

Alterations in the Nomenclature of 'Hand-list of the Birds of Australia.' By Gregory M. Mathews, F. R. S. E., etc. The Emu, Vol. X, April, 1911, pp. 317–326.

Nomenclature of Australian Avifauna. By Gregory M. Mathews. The Emu, Vol. XI, July, 1911, pp. 52–58.

other changes, the number of genera is greatly reduced (in the paper in 'The Emu') by omission as unnecessary, and others, as well as many species, as being extralimital. The greater part of the Brissonian genera are retained, but are accredited to later authors. Emended spellings are also now rejected.

In Part I of his paper in the 'Novitates' Mr. Mathews assumed that "binary" as used in the International Code of Nomenclature is synonymous with "binomial." Before the publication of his Part II he had received the 'Opinions rendered by the International Commission on Zoölogical Nomenclature' (Opinions 1–25), from which it became evident to him that "'binary' has an altogether different meaning" from binomial. Instead of accepting, however, the ruling of the Commission on the meaning of its own Code he proceeds to argue that the Commission is wrong and that 'binary,' according to dictionaries, is "absolutely equivalent to binomial," and proceeds to affirm his rejection of Brissonian genera! It is hard to reconcile this action with his repeatedly professed absolute adherence to "the laws formulated by the International Congress of Zoölogists." As a matter of fact, it is perfectly evident that the Commission intentionally employed the term binary for the purpose of conserving genera established by non-binominal authors of dates subsequent to 1758 as shown by their ruling (Opinion 20) on the genera of Gronow, and citation of Brisson under *Strix* (Opinion 16, pp. 33 and 38). Furthermore, these rulings foreshadow that if the genera of Brisson are ever brought before the Commission for arbitration their availability will be sustained.

Mr. Mathews, in ignoring Brisson as an author to be reckoned with, introduces confusion in questions of nomenclature that extend beyond the substitution of later authorities for Brisson's genera, as in the case of *Colymbus* and *Podiceps*, *Catarractes*, *Penguinus* and *Catharacta*; *Glareola* and *Trachelia*; *Carbo* and *Phalacrocorax*; *Hypsibates* and *Himantopus*; *Nisus* and *Accipiter*; *Curvirostra* and *Loxia*. Unfortunately for Mr. Mathews, his statements in regard to Brisson and *Colymbus* are erroneous, for he says: "Brisson independently introduced *Colymbus* for the Grebes: he never subdivided a Linnean genus; he used the same names as Linné, often with different significations, as for instance *Mergus*, which he used for the Divers though Linné had utilized it for the Mergansers." It is quite true that Brisson used a number of Linné's generic names in a different sense from that in which Linné had employed them, as did nearly every systematic writer of the latter half of the eighteenth century. During this period, and even for the quarter century following, each author took the liberty of doing as he pleased in matters of nomenclature; for the happy thought of a "law of priority" had not then taken form. But it is entirely erroneous to assert that Brisson "never subdivided a Linnean genus," for he did it in a large number of cases, intentionally and with good effect, adopting most of them in a restricted sense, but failing to conserve the names of a few of them. If Brisson's genera continue to be used, as they certainly will be, *Podiceps* is properly to be construed as a homonym of

Colymbus (Brisson ex Linné), and *Catarractes*, *Glareola*, *Phalacrocorax*, *Accipiter*, *Strix*, and *Loxia* will continue in use as at present, with the type of *Loxia* as *Loxia curvirostra* Linn., both by restriction (by Brisson) and by tautonymy (through Brisson), under Opinion 16 of the International Zoölogical Commission.

Among other generic names discussed attention may be called to the Linnean names *Charadrius* and *Tringa*. On the basis of tautonymy Mr. Mathews rules that the type of the former is *C. hiaticula* Linn., and of the latter *Tringa ocrophus* Linn. If these premises be granted *Charadrius* will replace *Ægialitis* Boie, and *Pluvialis* (authority Brisson, not *Schæffer*) will replace *Charadrius* of authors; *Tringa* will replace *Helodromas* Kaup, and *Canutus* Brehm will replace *Tringa* of authors. The types of both *Charadrius* and *Tringa* were left in abeyance in Opinion 16 of the International Zoölogical Commission.

Mr. Mathews considers that differences in the gender endings in generic names, as *-a* and *-us*, *-us* and *-um*, etc., do not require the rejection of names otherwise identical, and he would thus employ *Heteroscelus* Baird in place of *Heteractitis* Stejneger, and *Oxyura* in place of *Erismatura*, but in this latter case he states further that *Cerconectes* Wagler "appears to have [slight] priority" over *Erismatura*. *Marila* Oken is rejected in favor of *Nyroca* Fleming, on the assumption that Oken's bird genera of 1817 are untenable.

Œnanthe Vieillot is accepted for the Wheatears in place of *Saxicola* on the ground that the type of *Œnanthe* rested on tautonymy (*Motacilla œnanthe* Linn.) before a type was fixed for *Motacilla*. *Conurus* Kuhl is rejected because "not proposed generically," but merely as the name of a section, Mr. Mathew stating that he refuses "to accept names simply proposed sectionally as of their sectional date" — implying a distinction between section and subgenus, or other subgeneric divisions not definitely indicated as to grade. *Macrorhamphus* Forster is stated to be antedated by *Macrorhamphus* Fisher, which unfortunately is the case.

Chelidon Forster replaces (we believe properly) *Hirundo* auct. nec Linné; *Aluco* Fleming is said to be preoccupied by *Aluco* Link, and that *Tyto* Billberg (not *Tyta* Billberg of earlier date) or *Hybris* Nitzsch is available in its place.

Lack of space forbids mention of many other interesting rulings, some of which appear well-founded while others seems to invite further research.

Various new names, both generic and specific, are given to replace names considered untenable.

As is evident from the foregoing, Mr. Mathews's paper 'On some necessary Alterations in the Nomenclature of Birds,' demands serious consideration, containing, as it does, the results of much research, among its important features (in Part II) being the record from authentic sources of the dates of publication of various works issued in parts or in a series of volumes, as Lesson's 'Illustrations Zoologiques,' his 'Traité d'Ornithologique,' and 'Centurie de Zoologie'; of 'Cuvier's Le Régne Animal,'

and of Vieillot's contributions to the 'Nouveau Dictionnaire d'Histoire Naturelle.'

His first-cited paper in 'The Emu' (*l. c.*) gives the results of his nomenclatorial investigations as relating to Australian birds, with, in addition, his views as to the genera to be recognized, and the eliminations of extralimital genera and species. His second paper in 'The Emu' (*l. c.*) gives an explanation of the nomenclature and principles followed by him in the previous papers, for the benefit especially of Australian ornithologists. In this paper he states clearly why the changes he has proposed are necessary. The current nomenclature of Australian birds, being, like his own 'Handlist of Australian Birds,' that of Sharpe's British Museum 'Handlist,' is at many points not in conformity with the now generally accepted International Code of Zoölogical Nomenclature, which he has now adopted. He further makes a strong plea for the recognition of subspecies and the use of trinomial nomenclature, neither of which appear to have yet found much favor with Australian ornithologists. He also explains and advocates the determination of genotypes by "virtual tautonymy," and finally gives his reasons for his extensive reduction in the number of genera he adopts, citing especially *Charadrius* and *Tringa* and their modern subdivisions in illustration. We believe that in this extensive lumping of genera he will not win a large following. A quarter of a century ago the American Ornithologists' Union Committee on Nomenclature took the same view, and reduced a large number of then current genera to subgenera, which, some twenty years later, this same Committee began gradually to reinstate as full genera until in 1910, in the third edition of its Check-List of North American Birds, nearly all the previously rejected genera were reinstated. The Committee's action in 1885 in this matter failed to receive the approval of ornithologists at large, and we feel quite sure that in this respect history will again repeat itself, and that Mr. Mathews and his friend Dr. Hartert will find themselves in a small minority not only in the lumping of genera but in the rejection of Brissonian generic names.— J. A. A.

Hancock's 'Nature Sketches in Temperate America.'— As shown by the full title,[1] this book deals with outdoor life from the standpoint of ecology and evolution, as further indicated by the following transcript of the section headings: I. Evolution and Natural Selection (pp. 1–24). II. Adaptations in Animals and Plants, with examples (pp. 25–64). III. Protective Resemblance, with examples (pp. 65–114). IV. Mimicry, with examples (pp. 115–133). V. Warning Colors, Terrifying Markings, and other Protective Devices, with examples (pp. 135–164). VI. Animal Behavior, with examples (pp. 165–267). VII. General

[1] Nature Sketches | in | Temperate America | A series of sketches and a popular account | of Insects, Birds, and Plants, treated | from some aspects of their | Evolution and Ecological | Relations | By | Joseph Lane Hancock | M. D., F. E. S. | [illustration]. With two hundred and fifteen original | illustrations in the text, and twelve colored plates by the author | Chicago | A. C. McClurg & Co. | 1911.— 8vo, pp. xviii + 451. $2.75 net.

Observations and Sketches afield, with examples (pp. 269–314). VIII. Ecology — Interpretation of Environment as exemplified in Orthoptera (pp. 315–433). The author says: "This work consists essentially of suggestive essays drawn from observations afield, and treating of various insects, birds, and plants. In this account there is brought together a series of life histories of many animal forms. I have given more consideration here to the insects than to other groups of animals. I think this is justifiable when it is remembered how many more representatives of these animals populate the earth, as compared with other families of animals."

The work will appeal to the general reader interested in nature study through its wide scope, clear and non-technical descriptions, and evident scientific merit. The author is an entomologist of standing, whose special field is the Orthoptera, from which many of his illustrations and examples are drawn. In discussing general questions of evolution he quotes liberally from standard authors, including not only Darwin, Wallace, and Poulton, but the more recent investigators in the field of experimental biology, and current authorities in ecology. It is on the whole a safe guide, replete with original observations, and with illustrations on a liberal scale from the author's own sketches and photographs, and must prove a useful introduction to the study of the animal and plant life of "temperate America." Much of the work is based on studies and observations carried on for many years at Lakeside, Michigan. The ornithological matter is not extensive, consisting mainly of passing references, in the section on 'Animal Behavior,' to various species in illustration of the general subject, and to the Ruby-throated Hummingbird as an agent in the pollination of flowers.— J. A. A.

Curl's 'Notes on the Digestive System of Hydrocorax.' — In an illustrated paper[1] of six pages, the author gives a detailed account of the digestive system in *Hydrocorax hydrocorax* (Linn.), with special reference to the periodical casting-off of the lining of the stomach. This deciduous membrane "is formed by secretion from the glands of the stomach and after reaching its full thickness, separates spontaneously, leaving the glands to begin at once the formation of a new sac . . . . It seems reasonable to suppose that, at least when the breeding season is past, the food, mixed with, and acted upon by, the secretion of the proventricular glands, passes into the deciduous sac lining the stomach; here muscular action completes the mixing, triturates the food, and prepares the digestible parts to pass over into the duodenum. The refuse is then periodically ejected in the membranous sac. Whether this routine is changed in the breeding season, I cannot say." — J. A. A.

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[1] Notes on the Digestive System of *Hydrocorax*. By Holton C. Curl, Surgeon, U. S. Navy. Philippine Journal of Science, Vol. VI, No. 1, pp. 31–37, pll. i, ii. February, 1911.

Oberholser's Revision of the Ladder-backed Woodpeckers.[1] — This revision is based on the material available for study in the principal museums of the United States, numbering altogether 560 specimens, brought together by Mr. Ridgway for use in the preparation of his 'Birds of North and Middle America.' Under Mr. Oberholser's standard of subspecies "the six currently recognized races are here increased to fifteen." *Dryobates scalaris bairdi* of the A. O. U. Check-List is here treated as extralimital, with the assigned type locality the State of Hidalgo, Mexico. From the old *bairdi* of the Check-List are carved *D. s. symplectus* and *D. s. cactophilus*, the former ranging from southeastern Colorado south through Oklahoma and Texas into eastern Mexico, the latter from southeastern California, Arizona and New Mexico south into the State of Durango. The other seven new forms are from various localities in central and southern Mexico, and Nicaragua. The ranges of all the forms are indicated on an accompanying map.— J. A. A.

Oberholser's Revision of the Hairy Woodpeckers.[2] — This study, the author tells us, was undertaken largely at the request of Mr. Ridgway, and is based on the material he had gathered from the leading museums of this country for use in the preparation of the forthcoming fifth part of his 'Birds of North and Middle America,' the specimens of this group alone numbering 1070. As is well known, the Hairy Woodpecker group ranges from Alaska and northern Canada south to Panama, and comprises many well-marked forms. The fourteen hitherto currently recognized subspecies are here increased to twenty. The name of the Northern Hairy Woodpecker is changed from *Dryobates villosus leucomelas* (Boddaert) to *D. v. septentrionalis* (Nuttall). Boddaert's name was based on Brisson's description of his "Picus varius canadensis" and on D'Aubenton's plate of Buffon's "Epeiche du Canada," the locality being simply "Canada." Mr. Oberholser finding that the measurements given by Brisson and indicated in D'Aubenton's drawing appear to be "altogether too small for the large race of northern Canada," the name *leucomelas* is treated as a synonym of *D. villosus villosus* and replaced by the next available designation, based on birds from the Saskatchewan River. Inasmuch as the range of overlapping individual variation in the length of the wing in the two forms is one third of the average difference between them, and as Brisson's specimens are quite likely to have come from either Quebec or Montreal (Oberholser records specimens of the northern form from as far

[1] A Revision of the Forms of the Ladder-backed Woodpeckers (*Dryobates scalaris* [Wagler]). By Harry C. Oberholser, Assistant Ornithologist, Department of Agriculture. Proc. U. S. Nat. Mus., Vol. XLI, No. 1847, pp. 139–159, with map (pl. 12). Published June 30, 1911.

[2] A Revision of the Forms of the Hairy Woodpeckers (*Dryobates villosus* [Linnæus]). By Harry C. Oberholser, Assistant Ornithologist, Department of Agriculture. Proc. U. S. Nat. Mus., Vol. XL, No. 1840, pp. 595–621, with map (pl. 70). Published June 3, 1911.

south as Toronto), it seems by no means evident that the name *mesomelas* might not be properly retained for the northern form.

D. v. hyloscopus is restricted to the mountains of southern California and northern Lower California, the birds of the interior formerly referred to it now furnishing material for a new subspecies, *D. v. orius*; while another new subspecies (*D. v. leucothorectis*), is sliced from the southern border of what has been currently recognized as *D. v. monticola*. It is also to be noted that a new Mexican form, *D. v. icastus*, extends into southern Arizona from Sonora, making three new forms of the group for the United States. *D. v. fumeus* is based on specimens collected at San Rafael del Norte, Nicaragua, by Mr. William B. Richardson, for the American Museum of Natural History. The distribution of the twenty forms is conveniently shown on an accompanying map.— J. A. A.

Nelson on a New Hummingbird from Panama.[1] — Among the first fruits of the Smithsonian Biological Survey of the Panama Canal Zone [2] is a new genus and species of Hummingbird, recently described by Mr. Nelson as *Goldmania violiceps*. The species was discovered by Mr. E. A. Goldman, of the Biological Survey, U. S. Department of Agriculture, on the higher slopes of the Cerro Azul, a high mountain at the extreme headwaters of the Chagres River, and the genus is named in honor of Mr. Goldman, who for so many years was Mr. Nelson's assistant in his biological explorations in Mexico. It is allied to the genus *Saucerottea*, but has the median lower tail coverts highly specialized.— J. A. A.

McGregor on Birds of the Philippine Islands.— Mr. McGregor has published recently a number of papers on the birds of various islands of the Philippine Archipelago, to which brief references are here made. His paper on the birds of the island of Polillo [3] is said to be the first contribution to our knowledge of its fauna, and is based on a trip to the island in September, 1909, with two Philippine assistants. It records 101 species as collected or certainly identified, and discusses the ornithological relations of the island to Luzon and the neighboring smaller islands.

Lists of birds from Pauai and Mount Pulog, in the Subprovince Benguet, Luzon,[4] are based on a trip made to these localities in May, June and July, 1909, when 22 species were obtained or noted at Pauai, and 12 at Mount Pulog.

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[1] Description of a New Genus and Species of Hummingbird from Panama. By E. W. Nelson. Smithsonian Miscel. Coll., Vol. LVI, No. 21, pp. 1, 2. Published July 8, 1911.

[2] See *antea*, p. 152.

[3] Birds collected in the Island of Polillo, Philippine Islands. By Richard C. McGregor. Philippine Journ. of Science, Vol. V, No. 2, Sect. D., pp. 103–114. "Issued Oct. 17, 1910."

[4] *Ibid.*, pp. 135–138.

He has also additional notes on birds from northern Mindanao,[1] relating to 7 species, and a note on the migration of the Tic-wee Buzzard [2] (*Butaster indicus*) in the Philippine Islands, which it visits in great numbers in autumn. A plate gives two views of a living bird. There is also in this connection a further installment of his bibliography of Philippine ornithology.[3]

Another paper relates to the birds of Northern Luzon and to those of several neighboring small islands,[4] based on short visits made to the several localities in August, 1909. Owing to the limited time available only a few species were noted at each of eight different points visited.

His 'Notes on a Collection of Birds from Northern Negros' [5] are based on a collection made by Mr. Andres Celestino in February and March, 1909, It includes 55 species, of which four are believed to be here recorded from this island for the first time. A summary of previous papers relating to the birds of Negros forms a useful introduction to the present list.— J. A. A.

Reichenow on African Birds.— The notable activity of Dr. Reichenow in the field of African ornithology is evinced in the three important papers from his pen here under notice. The first is a report [6] on a collection of birds made in the region of the Rio Benito, Spanish Guinea, by Herr Tessmann in 1906–09. The collection numbered 194 species, and the briefly annotated list here given shows the close faunistic agreement of the birds of this region with those of the Kamerun coast region.

The second paper is a report upon a collection of birds made in the interior of Kamerun made by Herr Riggenbach in 1908–09, to which is added a list of all the species thus far known from Kamerun,[7] with the localities at which they have been taken. The collection contained about 1000 specimens, representing 305 species, of which 34, or 10 %, were new (since described by Reichenow in 1910 in Orn. Monatsb.). The annotations include not only the localities and dates of collecting, but often important technical comment on the relationships and ranges of some of

[1] Additional Notes on Birds from Northern Mindanao, Philippine Islands. Philippine Journ. of Science, Vol. V, No. 3, p. 197, "Issued Oct. 29, 1910."

[2] Note on the Migration of the Tic-wee Buzzard in the Philippine Islands. *Ibid.*, pp. 199, 200, pl. i.

[3] Philippine Ornithological Literature. *Ibid.*, pp. 203–209.

[4] Birds from the Coast of Northern Luzon and from the Islands of Sabtan and Dalupiri. *Ibid.*, No. 4, pp. 219–221. "Issued Dec. 29, 1910."

[5] *Ibid.*, Vol. VI, No. 1, Sect. D., pp. 39–46. "Issued May 3, 1911."

[6] Über eine Vogelsammlung vom Rio Benito im Spanischen Guinea. Von Ant. Reichenow. Mitt. Zool. Museum in Berlin, V. Band, 1. Heft, March, 1910, pp. 73–87.

[7] Die Ornithologischen Sammlungen der Zoologisch-Botanischen Kamerun-Expedition 1908 und 1909. Mit einer Übersicht aller bis jetzt aus Kamerun bekannten Vogelarten. Von Ant. Reichenow. Mitt. Zool. Museum in Berlin, V, Band, 2. Heft, Jan., 1911, pp. 205–258, with map showing the route of the Riggenbach Expedition.

the species or subspecies. The appended list of Kamerun birds numbers 660 species, with the localities where each is known to occur.

The third paper[1] relates to the avifauna of the lake region of Central Africa, including the region from Lake Victoria Nyanza west to the chain of lakes stretching from Lake Albert to Lake Tanganyika (about latitude 3° N. to latitude 7° S.). The list numbers 750 species, of which about 130 are West African forms, while 100 are typically East African. About the same number are of general Ethiopian distribution, 20 are typical northern forms, 50 are Eurasiatic migrants or wanderers, while about 200 are peculiar to the region, which is a subprovince of the West African forest region.

The annotations record not only the specimens collected during the expedition, but the general distribution of the forms is stated, with frequent comment on the relationships of some of the less known forms to their nearest allies. The introduction contains a bibliography of papers relating to the region published since 1905, and these and Reichenow's 'Vögel Afrikas' are cited in the text. The two colored plates that accompany this important paper illustrate five of the author's recently described species.— J. A. A.

Mathews's 'The Birds of Australia.'— Part 4[2] of this admirable work bears date "August 9th, 1911," and includes pages 185–234 and plates xlvi–lviii, and treats of Rails and Gallinules (Nos. 50–63). In addition to the usual descriptions and life histories of the species and subspecies, several new forms are here for the first time described, including a new subspecies of *Rallus pectoralis* from West Australia, a new subspecies of *Eulabeornis tricolor* from North Queensland, and seven new subspecies of *E. philippensis*, none of which latter, however, are from Australia. A revision of the *E. philippensis* group is made, of which twelve subspecies are diagnosed. The changes in nomenclature include the introduction for the first time of trinomials for several of the Australian forms of *Porzana*. The excellent plates, all drawn by Keulemans, were evidently printed before the author's recent adoption of his revised nomenclature. The life histories include much hitherto unpublished material, contributed to the author by valued correspondents. The species of Rails for the most part being well-known, the biographical matter is satisfactorily full. In Part 3,

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[1] Die Vogelfauna des Mittelafrikanischen Seengebietes. Auf Grund der Sammlungen Seiner Hoheit Herzogs Adolf Friedrich zu Mecklenburg. By Prof. Dr. Ant. Reichenow. Wissensch. Ergebn. der Centralafrika-Exped. 1907–08 unter Führung des Herzogs Adolf Friedrich zu Mecklenburg, pp. 231–374, pll. vii and viii, colored.

[2] The Birds of Australia. By Gregory M. Mathews, Member of the Australian Ornithologists' Union and the British Ornithologists' Union. With hand-coloured Plates. Volume I, Part 4, pp. 185–234, pll. xlvi-lviii, plus reissue of pp. 183 and 184, here cancelled. August 9th, 1911.

For notices of previous Parts see *antea*, pp. 135, 289, 376.

dealing with the Pigeons, the scarcity of biographical detail, to which attention was called in our notice of this part, we find was due to the fact that almost nothing is yet known of the life histories of the species thus seemingly neglected. The present Part indicates that the work is to be emphatically revisionary as regards questions of nomenclature and the status of forms belonging to the Australian Avifauna.— J. A. A.

Pearl on the Relative Conspicuousness of Barred and Self-Colored Fowls.[1]— In this paper are presented statistics of the fowls killed by natural enemies at the Maine Agricultural Experiment Station in 1909. The fowls were Barred Plymouth Rocks, Cornish Indian Games and crosses of these forms. Both the games and crosses were practically self or unicolored birds. The author comments on a note by Davenport [2] to the effect that of 24 chicks killed by crows in one afternoon at Cold Spring Harbor, Long Island, all but one were unicolored. Davenport's conclusion on the acknowledged fragmentary data was that the self-colors of poultry tend to be eliminated by the natural enemies and that pencilled birds are relatively immune from attack because relatively inconspicuous. Doctor Pearl agrees with the final phrase of this conclusion and presents four reproductions of photographs which strikingly illustrate the greater conspicuousness of the unicolored birds, at least under ordinary circumstances.

Davenport's conclusion will comfort those who believe in the protective value of color patterns which render animals inconspicuous to the human eye, but it is based on a single observation which for many reasons may have been misleading. Doctor Pearl however gives the proportions of barred and unicolored fowls among a total of 325, captured in one year by natural enemies from a flock of 3,343 at the Maine Agricultural Experiment Station. The natural enemies were rats, skunks, foxes, crows, hawks, and cats. Of the total number of birds 10.05 per cent were self-colored. Of all the eliminated birds 10.77 per cent were self-colored.

Of the self-colored birds 1.79 per cent were eliminated by recorded enemies (chiefly rats). Of the barred birds 2.26 per cent were eliminated by recorded enemies.

Of the self-colored birds 8.63 per cent were eliminated by unrecorded enemies (chiefly predaceous birds).

Of the barred birds 7.38 per cent were eliminated by unrecorded enemies. In other words, barred and self-colored chickens were captured by natural enemies about in proportion to their total numbers in the flock.

The author concludes that for the time and place under consideration, the relative inconspicuousness of the barred color pattern afforded its possessors no great or striking protection against elimination by natural enemies.

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[1] Am Nat., XLV, No. 50, Feb., 1911, pp. 107–117.
[2] Nature, Vol. 78, 1908, p. 101.

Evidence is accumulating that in the end will overthrow belief in the efficiency of what has been called protective coloration in speculative writings of the past 150 years. Like many other attractive theories that of protective coloration has been unduly elaborated, and facts opposed to it have been ignored. Those who have studied the food of birds, mammals, reptiles, and other groups constantly have the impression forced upon them that the so-called protective adaptations do not protect. Doctor Pearl's results go to confirm the belief that we have been unable to avoid and have often asserted that the influence of natural enemies taken as a whole, is indiscriminate. In other words their food is obtained from the various species they prey upon practically in proportion to the abundance of those species in the state of nature.— W. L. M.

Economic Ornithology in recent Entomological Publications.— In 'The hothouse milliped as a new genus'[1] O. F. Cook says "Prussic acid and other corrosive secretions may aid in the precipitation of colloidal substances in the humus, in addition to the protection that they give by rendering the millipeds distasteful to birds and other animals that might otherwise feed upon them." This statement implies that millipeds have no natural enemies, an Utopian condition probably no organism enjoys. Millipeds are the chief food of certain beetle larvæ, and are greatly relished by toads. They are eaten by armadillos and skunks at least among mammals and the brand of protection their secretions give them against birds is not exactly what men would choose to insure comfort and peace of mind. Records in the Biological Survey show that millipeds are eaten by no fewer than 83 species of United States birds, 36 of which are known to take considerable numbers of them.

Walter E. Collinge begins a new series of economic publications in his 'First Report on Economic Biology'[2] and as usual includes references to the food of various birds. Crane fly larvæ, well known pests of root and cereal crops, are recorded as doing serious injury to bulbs. The bird enemies of these insects include the starling, lapwing, pheasant, various gulls, and the rook. It is of particular interest that one of the shorebirds should be assigned great economic value, as the whole group has recently received that distinction in this country. Collinge says: "All the species of crane flies have increased enormously with the decrease of the lapwing and the same holds true with regard to wireworms and other soil pests."

Mr. Collinge presents a summary of his investigation of the rook, which has previously been reviewed,[3] and a note on the injurious budding of fruit trees by bullfinches. The stomachs of 176 birds collected in April and May, contained nothing but fruit buds, and there is evidence to indicate that damage to young fruit continues through June and July. Aggressive

[1] Proc. U. S. Nat. Mus., 40, 1911, p. 625.
[2] Birmingham, England. 1911, 78 pp.
[3] Auk, XXVII, No. 3, July, 1910, pp. 359, 360.

measures against bullfinches are recommended. An increase in the number of voles in the Midland counties is attributed to the ruthless destruction of owls and the kestrel. "It cannot be too widely known that the short-eared owl, the barn owl, and the kestrel feed very largely upon voles and mice and should be protected."

In a recent bulletin [1] of the Ontario Agricultural College Mr. L. Caesar makes certain statements showing that his experience with bird enemies of the codling moth is in harmony with that of most entomologists who have written on the subject. He says "when searching under bands and loose bark for larvæ in the spring, we have been surprised at the very large percentage that have perished during the winter. Sometimes as high as 90 per cent or more seem to have been destroyed by various causes. The chief of these, so far as we could see were birds, the grub of a small black beetle (*Tenebrioides* sp.) and diseases. Many birds at one time or another during the year feed upon either the adults or larvæ of the codling moth, but during the winter the most useful birds in this respect are the woodpeckers, especially the downy woodpecker and the chickadee. If these two birds are encouraged during winter by hanging bones or pieces of meat on the tree they will often stay in the orchard all year and search every trunk and large branch carefully for larvæ."

D. B. Mackie reports on the locust pest in the Philippines [2] mentioning several birds among the natural enemies. These are cuckoos, crows, small hawks and gallinaceous birds, including domestic fowls. An important paper [3] on the African migratory locusts by Dr. W. La Baume, discusses the natural enemies of several species. Under general remarks on natural enemies, the author says "there can be no doubt that they play an important part in the destruction of the locusts and are a valuable aid to man in the battle against the pests. Deserving especial mention are the 'locust birds,' accounts of whose gratifying work one constantly meets in the locust literature. It is to be commended that legal orders for their protection have been issued in many parts of South Africa, and demanded for them in other districts."

After mentioning the mammalian enemies of the brown locust (*Pachytilus sulcicollis*) Dr. La Baume says: "Of far greater importance as locust enemies are the birds, of which certain kinds in South Africa are significantly called 'locust birds,' because in locust time they persistently follow the migrating swarms and live almost exclusively upon the insects." The principal kinds are: a field swallow (*i. e.*, a swallow-plover or pratincole, *Glareola melanoptera*) known as the "little locust bird"; the jackal-buzzard (*Buteo jackal*), the two storks (*Ciconia alba* and *Ciconia nigra*) generally known as "big locust birds"; the marabou (*Leptoptilus crumenifer*), the blue crane (*Anthropoides paradisea*) the white-bellied stork

[1] No. 187, Jan., 1911, pp. 24, 25.
[2] Philippine Agr. Rev., III, No. 4, April, 1910, pp. 227–240.
[3] Beihefte z. Tropenpflanzer, XI, No. 2, April, 1910, pp. 65–128.

(*Abdimia adimii*) and a kind of ibis; other enemies are starlings, guinea-fowls, certain bustards, the black and white hornbill (*Buceros leucomelas*), several falcons (*Tinnunculus rupicolis, T. naumanni, T. rupicoloides, Milvus aegypticus*), rooks, plovers, lapwings, shining thrushes, weaver-birds, etc. Most of the birds eat nymphs of the locust as well as the winged form, some dig up the eggs and devour them.

The enemies of the red-winged locust (*Acridium septemfasciatum* are principally the same species that attack the brown locust. The white and black storks and guinea fowls are given special mention. As is the case with the enemies of other migratory locusts, birds rank highest among the vertebrate foes of *Schistocerca peregrina*. Especially in Usambara, wherever locusts were observed, they have been found by flocks of birds. In the mountains, hooded crows, buzzards, marabous and black storks, and on the plains marabous, waders, guinea fowls, and the ground hornbill (*Bucorax caffer*) made themselves useful.

Dr. A. Fredholm gives high credit to the bird enemies of the mole-cricket (*Scapteriscus didactylus*) which is responsible for an annual loss of $15,000 on field and garden crops in Trinidad.[1] He says: "First place among the natural enemies belongs to insectivorous birds. Three of our commonest birds, the savannah blackbird (*Quiscalus crassirostris*), the tickbird (*Crotophaga ani* L.) and the Qu'est ce qu'il dit (*Lanius pitanga*) feed freely on these insects whenever found, and were it not for their persistent hunting, the pests would have committed more extensive depredations in Trinidad than has been the case so far. The birds will not only quickly snap up any insects appearing above the ground, but they will also carefully scrutinise the vaulted top of every burrow they descry for any movement indicating the passage of the insect beneath. As soon as a criket is thus detected they will demolish the roof and drag it out."

Dr. Fredholm is of the opinion also that "The most effective as well as economic method of coping with the pest would undoubtedly be to protect its natural enemies: blackbirds, tickbirds, Qu'est ce qu'il dits, toads and lizards. These are true friends of the planters and it should be seen to that due protection is accorded them."

In a bulletin[2] of the North Carolina Experiment Station on insect enemies of cabbage, Mr. Franklin Sherman, Jr., mentions bird enemies of various pests. In relation to cutworms it is stated that the insect-eating birds "which spend much time on the ground are the most useful, especially the bobwhite, crow, blackbirds, meadowlark, sparrows, catbird, mockingbird, etc. These in the course of a season and especially when rearing their young, pick up many a juicy cutworm." It is not exaggeration to say that cutworms are eaten on sight by practically all birds that glean their food from the ground or from low vegetation. The author remarks that "we know but little about natural enemies of flea beetles . . . .

[1] Proc. Agr. Soc. Trinidad, XI, part 2, Feb., 1911, pp. 153–163.
[2] Vol. 32, No. 7, July, 1911.

possibly small birds like sparrows would pick a few of them off the cabbage plants, but our information is not very definite or satisfactory." Flea beetles as well as all other Chrysomelidæ, although classed as specially protected insects by supporters of the theories of mimicry and other phases of protective coloration, certainly are eaten by many birds. To cite instances of only a few genera of flea beetles alone, beetles of the genus *Phyllotreta* are at present known to be eaten by 5 species of birds, *Haltica* by ten, *Epitrix* by 12, *Systena* by 21 and *Crepidodera* by 26 species. Mr. Sherman notes a locality where English sparrows usually keep in check the harlequin bug (*Murgantia histrionica*). The same bird also does good work by eating cabbage worms (*Pontia rapæ*).

The larch sawfly (*Nematus erichsoni*) of which there have been serious periodical outbreaks in the United States since 1881, has defoliated thousands of acres of larch or tamarack in southern Canada, Michigan and Minnesota, during the present season. Dr. C. Gordon Hewitt, Dominion Entomologist, gave a lecture on the pest before a meeting of the Canadian Forestry Association in January, 1911,[1] in the course of which he emphasized the normal impracticability of directly combatting the insect. This condition makes the work of natural enemies of paramount importance. In commenting on the results of a study of the sawfly problem in England, Dr. Hewitt gives first rank among natural enemies to a parasitic Ichneumonid. "The chief of the other potent natural causes were the small voles or field mice and the birds, especially the tits." A paper[2] published in England by Dr. Hewitt gives further details regarding bird enemies: "When the larvæ were in the earlier stages it was found that the three species of Tits — the Great Tit, Cole Tit, and Blue Tit — fed upon them to a considerable extent. They were also assisted by Chaffinches, which were found feeding on the full grown larvæ. In addition to these birds, which perform no little service, great destruction of the larvæ was effected by the Rooks, Jackdaws, and Starlings which were to be seen in large flocks in and about the more seriously attacked plantations. They not only fed upon the larvæ on the trees but also followed them on the ground when about to spin their cocoons beneath the turf. When the larvæ had reached this stage one frequently found that the rooks had riddled the turf round the bases of the trees with holes in search of the larvæ."

The natural means of control can be assisted and augmented, "and such is the case with regard to the birds which have been mentioned as feeding on the larvæ; chief of these are rooks, jackdaws, and tits. In the districts where the trees are badly attacked these birds should not be destroyed on any account. The starlings and tits should be encouraged and protected by feeding them during the winter and thus prevent the customary great mortality which results from hard weather, and also

[1] The Spruce Budworm and Larch Sawfly. Kingston, Ont., 1911. 8 pp.
[2] Reprint from Journ. Bd. Agr., [London], XV, No. 9, Dec., 1908, 12 pp.

by the provision of nest-boxes in the plantations. Larch plantations are singularly devoid of suitable nesting places for birds and they should therefore be supplied. In England these insectivorous birds are not sufficiently encouraged in places where nesting sites are absent by the provision of nesting boxes, the value of which form of forest protection has been recognized for a number of years in Continental forests. The best type of nest-box is that designed by Baron von Berlepsch."

In the Canadian paper Dr. Hewitt gives the results of actual trial of this system of bird encouragement. "Nest boxes were distributed, an additional number being provided each year. Last year there were nearly 300 boxes and over 50% of these were occupied which indicates a considerable increase in the number of birds in view of the scarcity previous to their encouragement. Such a system of bird protection .... is carried on in Europe not only by individuals but also by those states in which the forests are important natural resources." Dr. Hewitt is strongly of the opinion that "If the natural means of control, such as birds, are encouraged and it is upon these and the parasites that the extermination of the pest chiefly depends, the attack will last for a much shorter length of time, and there will ultimately be less pecuniary loss than if a policy of *laisser faire* be adopted."

It is of interest in this connection that Mr. Vernon Bailey of the Biological Survey observed cuckoos and red-eyed vireos feeding on larvæ of this sawfly at Elk River, Minn., in July of the present year. Birds of several other species were abundant in the infested region. Stomach examinations show that the ruffed grouse, bobolink and least flycatcher feed upon this or closely related larvæ, and the range of these birds makes it probable that they will prove to be fond of the larch sawfly larvæ.— W. L. M.

An Australian Bird Book.[1] — The interest in ornithology in Australia, which resulted in the formation of the Australasian Ornithologists' Union in 1900, now finds its logical development, through the added stimulus of coöperative effort, in the publication of works on Australian birds designed to meet the wants of bird students of every class. Thus Mr. Gregory M. Mathews is producing an elaborate folio with colored plates, of which four parts have thus far appeared; Messrs. Lucas and Le Souëf have recently published a more convenient work, while the present volume "is intended as a pocket-book for field use, so that the many teachers, nature students, nature-lovers, schoolboys, schoolgirls and boy scouts who like to '*see* what they *look at*' may be able to name the birds they meet."

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[1] **An Australian Bird Book. A Pocket Book for Field Use. By J. A. Leach, M. Sc. With Introduction by Frank Tate, M. A., I. S. O. Published by Arrangement with the Education Department of Victoria. Melbourne, Whitcombe and Tomb Limited. 1911. 12mo., pp. 200. Numerous colored and half-tone figures. Price 3/6.**

Both as regards text and illustrations the author has shown excellent judgment in using the necessarily limited space at his command to the best advantage. Every one of the 395 species treated appears to be figured, many of them in colors. These illustrations were made from mounted specimens and if one must admit that they do not represent the highest type of taxidermy, at least they are useful.

As organizing inspector of nature study of the education department of Victoria, Mr. Leach is familiar with his audience and its special needs, and he has evidently supplied them satisfactorily and in a manner which should do much to promote bird study and bird protection in Australia.— F. M. C.

'Bird Stories from Burroughs.' — This small volume[1] has been gathered from Mr. Burroughs's books, dating from 1871 to 1909, and consists of chapters on about thirty species of the best known birds of the Northeastern States. A chapter is given to each species, and the "chapters are arranged in a sort of chronological order," according to the time of the bird's arrival in spring, or with reference to the season when the species is particularly conspicuous. Hence the Bluebird, Robin, Flicker, and Phœbe head the list, which includes the Crow, Whip-poor-will, two hawks, the Screech Owl, Ruffed Grouse, Chickadee, and some twenty other species which have been subjects of the author's special attention. The selections include also six of his bird poems. It is unnecessary to commend Mr. Burroughs's bird stories: the warm welcome they have always received is sufficient guaranty that the present selection from them will meet with a cordial reception. The eight beautiful drawings, four of them in color, of some of our best loved birds, by Mr. Fuertes, add greatly to the attractiveness of this little volume.— J. A. A.

McAtee's 'Local Names of Water-fowl and Other Birds.'.— In a brochure of 24 pages,[2] reprinted from 'Forest and Stream,' Mr. McAtee gives local names for 96 species, 61 of which are game birds (ducks, geese, and shorebirds), and the others various non-game birds, of which 16 are passerine birds. These names are mainly additional to those given by Trumbull in his 'Names and Portraits of Birds' (1888), and are compiled in part from 'The Auk' and other published sources, but chiefly from the author's own notes taken during field work made under the auspices of the Biological Survey in North and South Carolina and the Gulf States. "The principal additions now made to Trumbull's lists," says the author,

[1] Bird Stories | from Burroughs | Sketches of Bird Life | taken from the works of | John Burroughs | With Illustrations by | Louis Agassiz Fuertes | [Seal] Boston and New York | Houghton Mifflin Company | The Riverside Press — (No date = Sept., 1911.) 12mo. pp. viii + 174, pll. 8, 4 colored. 60 cents net.

[2] Local Names of Waterfowl and Other Birds. By W. L. McAtee, Biological Survey, Washington, D. C. 24mo, 24 pp., reprinted from 'Forest and Stream,' issue of July 29, 1911, pp. 172–174, 196, 197.

"are the French names, their translations, or the French and English combinations in use among the gunners of southern Louisiana."

Citations of localities where a name is used follow the name. A name index concludes this valuable contribution toward a more complete glossary of game bird local names.— J. A. A.

Game Protection in the United States.— The last annual review of game protection in the United States[1] notes "the steady progress in the movement for the increase of game by propagation and the establishment of game preserves"; the condition of the different species of game as to increase or decrease in 1910; game conditions in the National parks and game refuges, National bird reservations, State game preserves, and private game preserves; statistics of the importation of foreign game birds for stocking purposes; State game farms; protection of non-game birds; meetings of game and bird protective associations; administration and enforcement of game laws; legislation and court decisions affecting game and bird protection. It contains also a convenient 'Chronological Record of Game Protection for 1910.' The legislation in 1910 resulted in the passage of few laws affecting game protection; among them were several of importance, but most of them dealt with minor regulations affecting the limits of open seasons, bag limits, licenses, export of game, sale of game, etc. The court decisions were generally favorable to the constitutionality of contested game laws, including the right of a State to regulate the kinds of guns used in hunting game, even to the use of the automatic gun and the gun silencer.

Another brochure of interest in relation to game protection is 'The Game Market of To-day,'[2] which shows the rapid decrease of game in this country with the increase of population. "From a time when bounties were paid for [the destruction of] ruffed grouse and apprentices appealed from a diet of prairie chicken, we have reached a time when ruffed grouse are within the reach only of the rich and prairie chickens are not to be had at any price. The meat of all big game except deer has been withdrawn from the market, and in many large cities even deer are not in the market, either because of nonsale laws or owing to the limited supply. Rabbits and waterfowl are still offered in some numbers, and quail are on sale every open season in a number of cities; but wild turkeys, once so abundant that colonists shot them from their doorways, are rare in northern markets and are found in very limited quantities in the South; while native woodcock and other shore birds are sold only in small numbers, if at all. The

[1] Progress of Game Protection in 1910. By T. S. Palmer and Henry Oldys, Assistants, Biological Survey. United States Department of Agriculture, Bureau of Biological Survey — Circular No. 80. Henry W. Henshaw, Chief of Bureau. Issued June 29, 1911. 8vo, pp. 36.

[2] The Game Market of To-day, by Henry Oldys, Assistant Biologist, Biological Survey. Yearbook Depart. Agriculture for 1910, pp. 234–254.

period has arrived when European pheasants, grouse, and plover are rapidly replacing corresponding American birds; and unless suitable measures be adopted for preserving and increasing our own game, we shall doubtless have to depend more and more on imported game for our market supply."

The present scarcity of game is compared with its former abundance, and the cause of the decrease is traced to the recklessness of the early colonists and their pioneer successors in the settlement of the country, to the conversion of wild into cultivated land, and to unrestricted trade in game, aided by modern cheap rapid transit and cold storage. The present prices of game here and in Europe are compared, and also the cost in this country of European grouse, plover, etc. in comparison with the far greater cost of American game of similar character. "The principal reason for this apparent anomaly is," it is stated, "that the European game markets are largely supplied by private preserves, which are comparatively few in number and near the market, and which can maintain their stock at a fairly constant point; while the American supply is obtained from distant and numerous sources and is derived from wild and practically unregulated stock .... Free marketing of wild game leads swiftly to extermination, while game reared as private property may be marketed freely without reducing stock."— J. A. A.

Cooke on Migration Routes of North American Birds.[1] — Prof. Cooke states: "The Bureau of Biologic Survey of the United States Department of Agriculture has collected much information on the migration of North American birds, and this article is an attempt to put in popular form some of the data that have already appeared in the more technical bulletins and reports."

A number of outline maps effectively illustrate the text. The seven principal migration routes used by North American birds in their migrations to and from South America are thus graphically shown. We are warned against supposing that "these routes as outlined on the map represent distinctly segregated pathways. On the contrary, they are merely convenient subdivisions of the one great flightway which extends from North to South America. There is probably no single mile in the whole line between northern Mexico and the Lesser Antilles which is not crossed each fall by migrating birds." The great bulk of the land birds, both as to species and individuals, cross the Gulf to eastern Mexico, while two less important routes run from Florida through the West Indies to South America. The species of the western United States whose migrations are, on the whole, much less extensive, follow two main routes to their winter homes in Mexico.

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[1] **Our Greatest Travelers: Birds that fly from Pole to Pole and Shun Darkness: Birds that make 2,500 Miles in a Single Flight. By Wells W. Cooke, of the Biological Survey, U. S. Department of Agriculture. National Geographic Magazine, April, 1911, pp. 346–365, 6 maps.**

Nine interesting species are taken up in detail and their migration routes described and plotted. The extremes of direct and circuitous routes are exemplified by the Black-poll Warbler and the Cliff Swallow respectively. The two races of the Palm Warbler travel by wholly different routes to and from their winter homes. (The author, however, omits to state for the benefit of the general reader, that the Palm Warblers belong to two quite distinct subspecies). The migration line of the Eastern form is from northeast to southwest, while that of the Western race runs from northwest to southeast, the two lines crossing at right angles in Georgia.

The Connecticut Warbler on its southward flight in the fall follows a wholly different path from that by which it reached its breeding grounds in the spring. An elliptical route such as this is rare among land birds but is followed on a far larger scale by a number of water birds of which the Golden Plover is here taken as an example.

The greatest traveler of all is the Arctic Tern, which breeds in the Arctic regions and winters in the Antarctic, and in its annual wanderings between these two points must cover over 22,000 miles. The northward migration of the Robin is of interest as it keeps pace with the advance of spring, and the Robins of the Pacific side of the continent travel at a much more rapid rate than those of the Atlantic slope and the interior. A very narrow path from the United States to South America is followed by the Scarlet Tanager; while the Bobolink deserves special mention as it is extending its range towards the Pacific coast, thereby lengthening its route of migration.

Prof. Cooke also endeavors to trace the evolution of the present remarkable migration lines of the Golden Plover and maps the hypothetical routes of earlier times.— W. DeW. M.

Beal on the Food of Woodpeckers.[1] — This paper gives the results of the stomach examination of 3500 woodpeckers, representing 22 species. The number of individuals of each kind examined ranges from one of the Gila Woodpecker and two of the Ivory-bill to 684 of the Flicker and 723 of the Downy Woodpecker.

The Red-headed, Hairy and Red-bellied Woodpeckers and the Yellow-bellied Sapsucker are each represented by more than 270 specimens. As the individuals of these six species were taken throughout the United States range of each, representing many subspecies, and in every month of the year, the material is ample on which to base conclusions as to their economic value. With most of the remaining species, while the results are less conclusive, at least the general character of their food is well shown.

In the genera of the *Melanerpes* group the percentage of vegetable food exceeds that of animal, in *Picoides* and *Dryobates* the animal food greatly

[1] Food of Woodpeckers of the United States. By F. E. L. Beal, Assistant, Biological Survey. Biological Survey Bull. No. 37. 8vo, pp. 64, with 6 colored plates and 3 text cuts. May 24, 1911.

exceeds the vegetable part of the diet. The Pileated Woodpecker, the Flickers and the Sapsuckers, with the possible exception of *S. thyroideus*, are more or less intermediate in this respect.

Ants constitute the largest item of animal food, taking all the species collectively, and are actually the largest item in eight species. The smallest numbers are consumed by the Three-toed Woodpeckers and the members of the *Melanerpes* group. Beetles rank next in importance, and these two items combined constitute nearly one-half of the total food.

The vegetable food consists almost wholly of fruit, cambium and mast. Cambium is eaten chiefly by the Sapsuckers, while beech nuts are an important article of diet with the Red-head, and acorns form more than half the food of the California Woodpecker.

Prof. Beal concludes that the Sapsuckers are the only injurous species of the family in the United States, their damage to timber due to their fondness for cambium and sap being extensive and serious. The two species of Three-toed Woodpeckers are of particular value in our northern forests for their destruction of wood-boring coleopterous larvæ. The Downy Woodpecker is also one of the most useful species, its only fault, shared by several other Woodpeckers, being the dissemination of the seeds of poison ivy and poison sumach.

Each of the two stomachs of the Ivory-billed Woodpecker examined contained many destructive wood-boring larvæ. As the author says: "These powerful birds are able to reach wood-boring grubs in places where smaller species fail, and their large bodies require a great quantity of such food"; and further: "When we see how much good this woodpecker is capable of doing as a guardian of the forest, it seems deplorable that it should be allowed to be exterminated. Wise legislation, backed by intelligent public opinion, may retard, if not absolutely prevent, the present destruction and allow the bird to regain something of its former abundance. There is plenty of room for this splendid species and much need of its services in the great southern forests."

Colored plates by Fuertes, illustrating seven species, add to the usefulness of this valuable report.— W. DeW. M.

Publications Received.— **Bradbourne**, Lord, and C. Chubb. The Nomenclature of the Rheas of South America. (Ann. and Mag. Nat. Hist. (8) VIII, 1911, pp. 273–275.)

Burroughs, John. Bird Stories from Burroughs. 12mo, pp. viii + 174, pll. 8 (4 colored). Houghton Mifflin Co., Boston and New York. Sept., 1911. 60 cents, net.

Curl, Holton C. Notes on the Digestive System of *Hydrocorax*. (Philippine Journ. Sci., VI, 1911, pp. 31–37, pll. i, ii.)

Grinnell, J. (1) Early Summer Birds in Yosemite Valley. (Sierra Club Bull., VIII, 1911, pp. 118–124.) (2) Description of a New Spotted Towhee from the Great Basin. (University of California Publ., Zoölogy, VII, pp. 309–311, Aug. 24, 1911.)

Leach, J. A. An Australian Bird Book, a Pocket Book for Field Use. 12mo., pp. 200, numerous colored and half-tone figs. Whitcombe and Tomb. Price 3/6.

McAtee, W. L. (1) Our Grosbeaks and their Value to Agriculture. U. S. Depart. Agric., Farmers Bulletin 456. 8vo, pp. 14. June 30, 1911. (2) Our Vanishing Shore Birds. 8vo, pp. 9, pll. 3. April 8, 1911. (3) Local Names of Waterfowl and Other Birds. 16mo, pp. 24 (From Forest and Stream, July 29, 1911). (4) Three Important Wild Duck Foods. Bureau of Biological Survey, Circular No. 81. 8vo, pp. 19, Sept. 8, 1911.

McGregor, Richard C. (1) Birds collected in the Island of Polillo, Philippines. (Philippine Journ. Sci., V, 1910, pp. 103–114.) (2) Birds from Pauai and Mount Pulog, Province of Benguet, Luzon. (*Ibid.*, pp. 135–138.) (3) Additional Notes on Birds from Northern Mindanao, Philippine Islands. (*Ibid.*, p. 197.) (4) Note on the Migration of the Tic-wee Buzzard in the Philippine Islands. (*Ibid.*, pp. 199, 200, and plate.) (5) Philippine Ornithological Literature. III. (*Ibid.*, pp. 203–209.) (6) Birds from the Coast of Northern Luzon and from the Islands of Sabtan and Dalupiri. (*Ibid.*, pp. 219–221.) (7) Notes on a Collection of Birds from Northern Negros. (*Ibid.*, VI, 1911, pp. 39–46.)

Madarász, J. v. (1) Neue Vögel aus Afrika. (Ann. Mus. Nat. Hungariai, IX, 1911, p. 339–342). (2) *Thalurania venusta* (Gould) und *Colibri cabanidis* (Heine) als selbstständige Formen. (*Ibid.*, p. 357.)

Nelson, E. W. Description of a new Genus and Species of Hummingbird from Panama. (Smiths. Misc. Coll., LVI, no. 21, pp. 2. July 8, 1911).

Matthews, Gregory M. (1) Birds of Australia, Pt. 4, (Aug. 9, 1911). (2) On some necessary Alterations in the Nomenclature of Birds. (Nov. Zoolog., XVII, pp. 492–503; XVIII, pp. 1–22.) (3) Two new Australian Birds. (*Ibid.*, p. 23.) (4) Nomenclature of Australian Avifauna. (Emu, XI, 1911, pp. 52–58.)

Oberholser, Harry C. (1) A Revision of the Forms of the Hairy Woodpecker (*Dryobates villosus* [Linnæus]). (Proc. U. S. Nat. Mus., XL, No. 1840, pp. 595–621, with pl. 70, June 3, 1911.) (2) A Revision of the Ladder-backed Woodpeckers (*Dryobates scalaris* [Wagner]). (*Ibid.*, XLI, No. 1847, pp. 139–159, pl. 12. June 30, 1911.)

Oldys, Henry. The Game Market of To-day. (Yearbook U. S. Dept. Agric. for 1910, pp. 243–254.)

Oldys, Henry, C. E. Brewster, and Frank L. Earnshaw. (1) Game Laws for 1911. U. S. Dept. Agric., Farmers' Bulletin 470. (2) Open Seasons for Game, United States and Canada, 1911. Biological Survey, Poster No. 24, July 27, 1911.

Palmer, T. S. Directory of Officials and Organizations concerned with the Protection of Birds and Game, 1911. Bureau of Biological Survey Circular No. 83. 8vo, pp. 16. Aug. 5, 1911.

Palmer, T. S., and Henry Oldys. Progress of Game Protection in 1910. Bureau of Biological Survey, Circular No. 80. June 29, 1911.

Reichenow, Ant. (1) Über eine Vogelsammlung vom Rio Benito im Spanischen Guinea. (Mitt. Zool. Mus. in Berlin, V, 1910, pp. 73–87.) (2) Die Ornithologischen Sammlungen der Zoologisch-Botanischen Kamerun-Expedition 1908–1909. (*Ibid.*, pp. 205–258, mit Kart.) (3) Die Vogelfauna des Mittelafrikanischen Seengebietes. (Wissensch. Ergebn. der Zentralafrika-Exped., 1907–1908, III, pp. 231–374, pll. vii, viii, col.)

Schiebel, Guido. (1) Meine ornithologische Frülings-Studienreise nach Corsica (1910). Roy. 8vo, pp. 21, 1911. (2) Neue Vogelformen aus Corsica. (Orn. Jahrb., 1910, Heft 3.) (3) *Turdus viscivorus reiseri* subsp. nov. Misteldrossel aus Korsica. (*Ibid.*, May, 1911.)

Annals of Scottish Nat. Hist., No. 79, July, 1911.

Avicultural Magazine, (3) Nos. 9–11, July–Sept., 1911.

Bird-Lore, XIII, No. 4, July–Aug., 1911.

British Birds, V, Nos. 2–4, July–Sept., 1911.

Bulletin British Orn. Club, No. CLXXI, July, 1911.

Condor, The, XIII, Nos. 3, 4, 1911.

Emu, The, XI, July, 1911.

Forest and Stream, LXXVII, Nos. 1–13, 1911.

Ibis, The, (9) V, Jan.–July, 1911.

Journal für Orn., LIX, Heft 3, July, 1911.

Journal Maine Orn. Soc., XIII, No. 2, June, 1911.

Journal South African Orn. Union, VII, No. 1, July, 1911.

Messager Ornithologique, II, No. 2, 1911.

Ornithologische Monatsberichte, XIV, Nos. 7–8, July–Aug., 1911.

Ornithologische Monatsschrift, XXXVI, Nos. 5–8, 1911.

Ornithologisches Jahrbuch, XXI, Heft 1–2, Jan.–April, 1911.

Ottawa Naturalist, XXV, Nos. 4–6, July–Sept., 1911.

Philippine Journ. Science, VI, Nos. 1–3, 1911.

Science, N. S., XXXIV, Nos. 861–873, 1911.

Zoölogical Society of London, Abstr. of Proc., Nos. 98, 99, 1911.

Zoölogist, The, (4) XV, July–Sept., 1911.

CORRESPONDENCE.

Cooke's 'Distribution and Migration of North American Shorebirds.'

EDITORS OF 'THE AUK':—

Dear Sirs:—

I feel it my duty to call attention to some rather important omissions in the list of sources for Prof. W. W. Cooke's valuable and for the most part admirable report on the 'Distribution and Migration of North American Shorebirds,' issued as Bulletin No. 35 of the Biological Survey (1910). This report contains the statement by the Chief of the Survey that "a knowledge of the summer and winter abodes of the several species and of the routes they take in migration is essential to intelligent legislation in their behalf, and, accordingly, *all the known facts in regard to this part of their life history are here brought together*" (the italics are mine); and the author, Prof. Wells W. Cooke, states that "the data on the breeding and wintering of the shorebirds has been collected from all available printed sources," as well as from other sources named. The author's statement as to the dates of migration is that they "have been obtained principally from the migration schedules sent in by the several hundred observers in the United States and Canada, who for a quarter of a century have contributed to the Biological Survey spring and fall reports of their observations." It seems natural to infer that in the case of the migration data, as with the breeding and wintering, the printed sources would be consulted.

Now, without attempting a thorough investigation of the field, I find that three publications of some importance seem to have entirely escaped the attention of the compiler. These are 'The Birds of Essex County, Massachusetts,' by Charles W. Townsend, Nuttall Ornithological Club, 1905; 'The Birds of the Cambridge Region,' by William Brewster, Nuttall Ornithological Club, 1906; and 'Birds of Labrador,' by C. W. Townsend and Glover M. Allen, Boston Society of Natural History, 1907. It may seem almost incredible that these three publications, which must be recognized as absolutely authoritative in their respective fields, could have been overlooked, but an examination of the report proves conclusively that such is the case. A consultation of Townsend and Allen's 'Birds of Labrador,' for instance, would have informed Professor Cooke that the Northern Phalarope is a common summer resident in Labrador and breeds along the entire coast and that Turner's Ungava Bay record is by no means the only one for the peninsula, Audubon, Low, Bigelow, and Spreadborough having found the bird there, as well as Townsend and Allen. Mr. Brewster's 'Birds of the Cambridge Region,' too, would have furnished in its record of Feb. 13, 1890, an earlier date for the Woodcock's arrival

than Professor Cooke's earliest for eastern Massachusetts, Feb. 22, 1902. Moreover Cooke gives no fall dates for the Woodcock in Massachusetts, while Brewster gives November 10 as the average date of departure and December 13 as the latest. So in the case of Wilson's Snipe, Cooke gives no dates for spring departures in Massachusetts and no fall dates for that State, all of which he might have obtained from 'Birds of the Cambridge Region,' besides getting an earlier date for the spring arrival. The Pectoral Sandpiper is known to Massachusetts ornithologists and sportsmen as an abundant fall but rare spring migrant, and is so characterized in 'The Birds of Essex County.' Cooke, however, says nothing of its rarity in the East in spring, simply stating that it "has a very pronounced southeastward migration in the fall," and that "it is a common migrant throughout the whole of North America east of the Rocky Mountains." For the Spotted Sandpiper Cooke's latest date for eastern Massachusetts is October 14, while Brewster has November 1 and Townsend November 14. The Cartwright records of the Eskimo Curlew given in 'Birds of Labrador' are very full and interesting, covering the dates from July 28 to October 24. These, of course, are omitted from Mr. Cooke's report, which gives only two records of the bird for Labrador, the regular point of departure of the species on its southern migration! Of the Golden Plover, Cooke says that it appears not infrequently at Cape Cod and Long Island. As a matter of fact the species is not extremely rare on other parts of the Massachusetts coast. Townsend's dates for Essex County are Aug. 23–Nov. 2. Cooke misses the second record of Wilson's Plover for Massachusetts, — that of one found by Dr. Townsend in a gunner's bag at Ipswich, May 8, 1904,— and says that it "has wandered once to Massachusetts."

These notes are only fragmentary, but they are sufficient, I think, to show that Professor Cooke's paper on the distribution and migration of the Shorebirds must be regarded simply as an analysis of the official data of the Biological Survey supplemented by the records of the National Museum and by *some* reference to the literature, and not, as we are led to expect, a full statement of "all the known facts in regard to this part of their life history." Valuable as they are, it is much to be regretted that these studies were not made complete within their limits; and while we must be grateful to Professor Cooke for bringing these data together and publishing them for the benefit of ornithologists, legislators, and the public in general, it is well to know just what they are and what they are not.

Yours very truly,

West Roxbury, Mass.
Aug. 29, 1911.

FRANCIS H. ALLEN.

NOTES AND NEWS.

Dr. Adolf Bernhard Meyer, an Honorary Fellow of the American Ornithologists' Union, died in Berlin February 5, 1911, at the age of 71 years. He was born in Hamburg in 1840, and received his education as physician and naturalist in Berlin. In 1874 he was appointed Director of the Royal Museum of Zoölogy, Anthropology, and Ethnography at Dresden, which position he held for thirty-two years, resigning from it in 1896. He spent a number of years as a successful explorer and collector in the Eastern Archipelago, passing three years (1870–73) in the Celebes and visiting New Guinea and the Philippine Islands, this expedition resulting in his great work 'On the Birds of Celebes and the Neighboring Islands,' published in two quarto volumes in 1898, in joint authorship with L. W. Wiglesworth, his English assistant in his explorations (reviewed in this journal, XVII, Oct. 1900, pp. 399–401). His principal other general ornithological work was his 'Abildungen der Vogel-Skeleten,' in two quarto volumes with over 200 plates (1879–97), but his minor ornithological papers are very numerous, many of them important, and all characterized by care and accuracy. He also published many anthropological papers, based largely on his work in the Eastern Archipelago. He was also an able museum director and greatly advanced the growth and efficiency of the Dresden Museum, so long under his management. His invention of the famous 'Dresden Case,' of glass and iron, after long study, has met with wide approval, it having been adopted in many other museums. His later years were devoted to linguistic and anthropological research. His scientific attainments won for him wide recognition, he having been made an Honorary or a Corresponding Member of a large number of the learned societies and academies of the world.

Readers of 'The Auk' will be interested in the following editorial statement that will appear in the October issue of 'Bird-Lore' respecting the long-continued illness of Mr. William Dutcher, formerly for many years the zealous and efficient Treasurer of the A. O. U., who was stricken with paralysis in October, 1910 (see *antea*, p. 151):

"On October 15, 1911, a year will have passed since the National Association of Audubon Societies was robbed by illness of the guidance and counsel of its President and Founder, William Dutcher. During this period, Mr. Dutcher has lain helpless and speechless at his home at Plainfield, New Jersey. His mental faculties, at first dimmed by the blow which fell so suddenly, were subsequently restored to him, and he not only recognizes, but welcomes gladly, those of his friends who are privileged to see him.

"As the leader of a great movement, the remarkable success of which is due to his untiring, unselfish, broad-minded efforts more than to those of any other man, Mr. Dutcher won the admiration and respect, not only

of his friends and associates, but even of those whom he felt it his duty to prosecute for violations of the law to the support of which his life is pledged.

"Deserving, however, as he was of the place he filled while in the full enjoyment of health and during a life of extraordinary activity, he never was more worthy the esteem of the friends or foes of bird protection than at this moment when, with almost more than human fortitude, unbroken by a year of sore trial, he faces the future with the patience and courage of a truly brave man."

NOTWITHSTANDING some unexpected delays, and a shorter time for the work, than was anticipated, the ornithological results of Mr. A. C. Bent's (see *antea*, p. 292) expedition to the Aleutian Islands were important in the amount of material obtained and in opportunities for field work. A delay of three weeks at Seattle, Washington, gave opportunity for collecting a good series of the local birds, including three specimens of the rare Northern Spotted Owl. Another delay in starting for the north prevented the expedition from reaching Unalaska till June 4, and its vessel, the U. S. Revenue Cutter 'Takoma,' was detailed early in July to the Bering Sea patrol. This left only a little more than three weeks in which to make the 1600 mile trip out to Attu Island and return. During the trip, however, collections were made at Akim, Amaknak, Unalaska, Atka, Kiska, Attu, Tanaga, and Adak islands, four or five days being spent at each. About 200 specimens of Ptarmigan were obtained (among them a new form), and good series of the land birds, including two species, Asiatic stragglers, new to the North American list, and one specimen of the rare Fisher's Petrel. On July 3, Messrs. Bent, Beck, and McKechnie sailed north on the gasolene schooner 'Polar Bear,' leaving Wetmore at Unalaska to visit Unimak Island and then work slowly homeward along the south side of the Alaska Peninsula, while Bent and his party visited the Pribilof Islands and went thence north to St. Matthew and Hall islands. They passed the famous volcanic island, Bogoslof, swarming with colonies of Pallas's Murre. They reached Nome July 11, where the party remained collecting for a week, when Bent and McKechnie returned to Seattle, leaving Beck to continue the work there till September. By the middle of July about 1000 birds had been collected, with Beck and Wetmore still in the field.

WE ARE indebted to Mr. E. A. Goldman of the Bureau of Biological Survey for the following statement of progress in the Biological Survey of the Panama Canal Zone (see *antea*, p. 152), from which it appears that the field work has been practically finished. Mr. Goldman reports as follows:

"On December 22, 1910, I sailed from New York for Panama where I was engaged until the latter part of June on the Biological Survey of the Canal Zone which is being carried on by the Smithsonian Institution.

Landing at Cristobal in the Canal Zone, December 28, I proceeded to Culebra, the administrative headquarters for the construction of the Panama Canal. The survey received the active assistance of the Isthmian Canal Commission, and through the courtesy of the Chairman I was assigned comfortable quarters at Gatun. This point was at once chosen as the most favorable base for work in the Gatun Lake area, in which it seemed especially important to secure representative natural history collections before further biological changes incident to the canal construction had taken place. From this convenient base, where my Costa Rican assistant usually remained to prepare specimens, daily excursions were made into the surrounding country, or to more distant points along the line of the Panama Railroad. The Chagres River and some of its tributaries were explored by canoe, and in March an overland trip was made from the Pacific coast into the mountains near the headwaters of the river. The latter part of May and part of June were spent at Porto Bello, on the north coast, and in the mountains near.

"The field work of the season resulted in a collection of nearly 2500 birds and mammals, and other material for use in a general report on the fauna of the region.

"Other members of the survey — Dr. S. E. Meek, Mr. S. F. Hildebrand, Dr. E. A. Schwartz, Mr. August Busck and Mr. W. R. Maxon — have also returned and report good success in their respective branches of the work. Mr. Henry Pittier expects to continue botanical work in the field until about the first of December."

The British Ornithologists' Union Expedition to New Guinea has been given up, owing to the impossibility of reaching the snowfields by the supposed most advantageous route, and the exploring party has returned to England. Its collection of 2300 skins of New Guinea birds has reached the South Kensington Museum, together with 200 bird skins collected in Borneo and about 450 obtained in Ceram.

According to a recent announcement in 'The Emu' (X, Dec., 1910, p. 155) the name of the Australasian Ornithologists' Union has been changed, to Royal Australasian Ornithologists' Union, thus obviating any possible confusion in the use of the initials "A. O. U." for two organizations of similar character, one in North America, the other in Australia.

We learn from 'The Ibis' (July, 1911, p. 580) that Lord Bradbourne and Mr. Charles Chubb, of the Zoölogical Department of the British Museum, have undertaken the preparation of a new work on the Birds of South America. "When completed it will consist of sixteen volumes of quarto size illustrated by coloured plates drawn by Grönvold. The first volume will contain a List of the Birds of South America. This is well advanced. Volume II, containing the first portion of the general

work, will be issued early in 1912, and subsequent volumes at intervals of about nine months, each volume consisting of about 300 pages and of from 25 to 30 plates."

At the Annual General Meeting of the British Ornithologists' Union held May 10, 1911, it was voted: "That the Committee [=Council] consider it desirable that a new edition of the Union's List of British Birds be prepared, and that a Special Committee be appointed with a view to preparing the same." It was further voted that the President (F. Du Cane Godman), the Editors (P. L. Sclater and A. H. Evans), and the Secretary (J. Lewis Bonhote), Mr. W. R. Ogilvie-Grant, Mr. H. E. Dresser, Mr. W. Eagle-Clark, and Dr. N. F. Ticehurst, be requested to act on this Committee." The original B. O. U. 'List of British Birds' was published in 1883, three years before the first edition of the A. O. U. Check-List was issued, or twenty-eight years ago. The new edition doubtless will be awaited with great interest not only by British ornithologist, but by ornithologists at large.

A Committee of the Linnæan Society of New York has recently taken over the work of tagging birds for future identification as an aid in studying the migrations and other movements of birds, and in further prosecution of the work has issued the following explanatory circular:

New York, September 18, 1911.

To all Members of the A. O. U.:

You are probably aware of the existence of the American Bird Banding Association, which was organized in 1909 to encourage the marking of individual wild birds for the purpose of recording accurate data on their movements. The method employed is the placing of inscribed metal bands on the legs of any birds, young or old, that can be captured unhurt, and setting them free again with the realization that if ever the bird should be recovered a definite knowledge of its travels would be obtained.

The great value and ultimate possibilities of the scheme have been well set forth in the reports already published (Auk, XXVI, April, 1909, pp. 137–143, and Auk, XXVII, April, 1910, pp. 153–168); and great credit must be accorded the Committee formerly in charge for the splendid results achieved. The members of that Committee, however, by reason of pressure of other duties, and of being distantly separated from one another, have been unable of late to give the attention they desired to the American Bird Banding Association, and have expressed a wish to have this work placed in other hands. The Linnæan Society of New York, having the advantage of a centralized membership, and of the American Museum of Natural History as a bureau for the return and keeping of records, tendered its services, which were accepted.

Only by the coöperation of a large number of ornithologists in the task of bird marking can real advance ever be made in solving many of the

commonest questions of bird migration; the efforts of a few can never avail much. We are therefore endeavoring to interest all bird lovers in the importance of the work. The limited funds secured by the former Committee have been almost exhausted, and we estimate that the sum of $500 should be raised at once. This will place the affairs of the Association on a substantial basis and enable the work to be pushed as its scientific importance demands, and as it is already being pushed in many countries of Europe.

We believe that you appreciate the value of the work we have undertaken, and we appeal to you for your coöperation and for a contribution to the fund.

Please make checks payable to Howard H. Cleaves, Secretary-Treasurer, and mail to Public Museum, New Brighton, New York City.

Respectfully yours,

Committee in charge of Bird Banding
WILLIAM WRIGHT GRANT.
CLINTON G. ABBOTT.
HOWARD H. CLEAVES, Sec'y-Treas.
Public Museum, New Brighton, N. Y.

THE CRITICISM has repeatedly been made that the present volume of 'The Auk' does not conform strictly to the third edition of the Check-List, in respect to the use of trinomials for *all* subspecies. In almost all cases the Editor has followed the preference of the contributors as indicated in their manuscripts, believing that no ambiguity would result where the accompanying vernacular name and the geographical area concerned render it evident that only the eastern form of a group of subspecies can be intended. In the case of the Robin, Bluebird, Song Sparrow, Lincoln's Sparrow, Tree Sparrow, Fox Sparrow, Meadowlark, Purple Martin, Cardinal, Yellow Warbler, the various species of Wren (House, Winter, Carolina, Bewick's, etc.), Chickadee, and in a great number of other instances, it seems needless, not to say pedantic, to burden the text with the full form, as in *Planesticus migratorius migratorius, Sialia sialis sialis, Melospiza melodia melodia, Passerella iliaca iliaca, Sturnella magna magna, Thryophilus ludovicianus ludovicianus*, etc., in casual references or informal mention of birds, or even in local lists, when the locality is in the Eastern or Middle States, where no other form of the species occurs. In the case of intermediate districts, or from the eastern border of the Plains westward, where two or more forms of a species may occur, it is obvious that the full form of the technical name should always be used, and of course in all systematic works and technical papers. This is an explanation, not a dictum nor a defense.

THE SEVENTH ANNUAL MEETING of the National Association of Audubon Societies will be held at the American Museum of Natural History, New York City, October 31, 1911. In addition to the election of officers and

the transaction of other routine business, arrangements have been made for a 'Nature Study Symposium,' at which addresses will be given by prominent Nature Study teachers, with exhibits of specimens and of methods of instruction; also of artificial nesting-sites and other devices for the preservation and increase of birds.

THE TWENTY-NINTH STATED MEETING of the American Ornithologists' Union will be held at the Museum of the Academy of Natural Sciences at Philadelphia, beginning on the evening of November 13, 1911. The evening session will be a business meeting for the election of officers and members, and for the transaction of routine business. Tuesday and the following days of the meeting will be for the presentation and discussion of scientific papers and will be open to the public. Members intending to present communications should forward the titles to the Secretary, Mr. John H. Sage, Portland, Conn., so as to reach him not later than November 8, in order that the program of papers may be duly prepared.

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ERRATA.

Page 8, line 11, for **Merganser serrator** read **Mergus serrator**.
" 8, " 39, for **hyperborea** read **hyperboreus**.
" 10, " 40, for **Carthartes** read **Cathartes**.
" 12, " 27, for **saya** read **sayus**.
" 38, " 15, for **Phalænoptila** read **Phalænoptilus**.
" 136, " 27, for E. E. Lodge read G. E. Lodge.
" 150, " 39, after 1901 add, when he was transferred to the class of Members.
" 150, " 44, for Ecstorm read Eckstorm.
" 152, " 9, for S. H. Rhoads read S. N. Rhoads.
" 265, " 13, after immaturity add, or a female.
" 291, " 7, for Shelly read Shelley.

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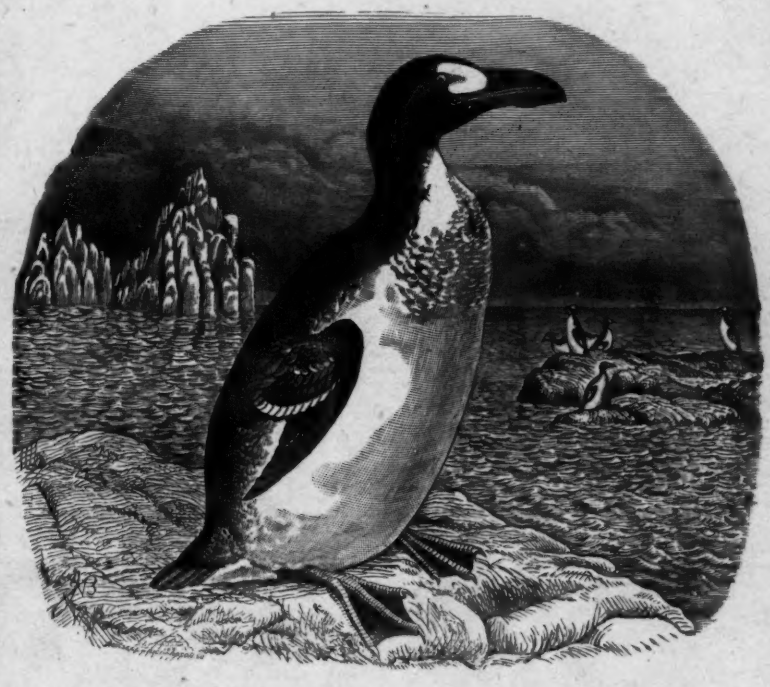

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